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PICTURE GALLERY: A STRUCTURED PRESENTATION OF
OAO-2 PHOTOMETRIC DATA SUPPORTED BY UBV, ANS, AND TD1 OBSERVATIONS

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ABSTRACT

Stellar fluxes for 531 stars in the wavelength range $\lambda\lambda$ 5500-1330 \AA are presented in the form of graphs. OAO-2 medium band interference filter photometry for all the stars is supplemented by UBV photometry from various sources for most of the stars, ANS photometry (3300-1550 \AA) for 353 objects, and the TD1 2740 \AA point whenever available (304 stars). The stellar magnitudes are on an absolute energy basis where

$$m_{\lambda} = -2.5 \log F_{\lambda} - 21.10.$$

The stars have been divided into 52 different categories on the basis of their spectral types and objects within one category are shown together. The merging of the four photometric systems, as well as the way the objects are ordered, should be helpful for such studies as interstellar reddening, luminosity effects, bandwidth effects, and comparisons with model stellar atmospheres. In addition, the catalogue could be used to find stars with specific properties (visual magnitude, spectral type, luminosity class, E_{B-V}) for comparison with, for example, observations obtained with the International Ultraviolet Explorer. The agreement between the various ultraviolet photometric systems for early type stars is generally better than 0.10 mag. Stars with known and/or observed variability have been grouped separately. A list of stars with observed photometric properties which are indicative of stellar or interstellar anomalies is also provided.

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I. INTRODUCTION

The Wisconsin Experiment Package on board the Orbiting Astronomical Observatory (OAO-2) contained eleven medium band interference filters in the wavelength range $\lambda\lambda$ 4250-1330 Å as well as two medium resolution spectrum-scanners operating from 3600-1850Å and 1850-1160Å respectively. Two European satellites (ANS and TD1) have also contributed greatly to the data-base of ultraviolet observations. The five-channel ultraviolet photometer aboard the ANS (Netherlands Astronomical Satellite) covered the wavelength region 3300-1550Å. The TD1 satellite had a 2740Å photometer channel and a spectrophotometer covering the wavelength region 2550-1350Å.

The OAO-2 photometry used in the present work have been taken from Code et al. (1980). A description of the OAO system and a very complete list of references on earlier OAO publications are presented in that paper.

The UBV photometry used here are those numbers listed in Code et al. (1980). The sources of the UBV data are also given in that paper. In the case where the (U-B) color was not given in the OAO catalogue, a (U-B) color was taken from the TD1 catalogues (Jamar et al. 1976 or Macau-Hercot et al. 1978) when possible. (This was done for 14 stars.) For μ Cen (HD120324) and HD168021, the V and B-V were taken from Hoffleit (1964) and Fernie (1962) respectively.

The ANS data used were those available per September 1979 and included a correction for the ANS-linearity problem described by Gilra (1979). It may be that in the final catalogue, which will be available by early 1980, some magnitudes will differ by a few hundredths from the data presented here. Such changes are not likely to be relevant for the applications for which this presentation is intended. The most recent description of the ANS system

can be found in Wesselius et al. (1980). That paper also provides standard intrinsic colors for main sequence stars earlier than F0. Preliminary colors for later spectral types and higher luminosities are included in Wu et al. (1980).

The TDI data have been taken from the catalogues by Jamar et al. (1976) and Macau-Hercot et al. (1978). The 2740\AA fluxes given there were converted to magnitudes using $m_{\lambda} = 0$ for $F_{\lambda} = 3.63 \text{ E-09 erg cm}^{-2} \text{ sec}^{-1}$. To the resulting number we applied the correction to be discussed in the next paragraph. (TDI spectrophotometry in the wavelength region $1350\text{--}2550\text{\AA}$ are also available for the stars which have the 2740\AA magnitude given in this work. The data are found in the above catalogues.)

Rather than just plotting the numbers found in the various source catalogues, we have chosen to present the data on a homogenized absolute calibration system. As the OAO-2 filter-set covers the largest wavelength region, we have adjusted the ANS five-channel photometry and the TDI 2740\AA filter channel in such a way that a smooth brightness distribution as a function of wavelength results for early-type stars. It should be mentioned that using the OAO photometer absolute calibration as the primary reference in the present compilation is for convenience only. No judgment as to which system is right is implied or intended. The corrections adopted are listed in Table 1. The values given for the U and B filters follow directly from the calibration of the UBV system (e.g. Allen, 1973).

II. DESCRIPTION OF THE CATALOGUE

The 52 categories in which the 531 stars were divided are given in Table 2. The ordering is by spectral type and luminosity class, but different spectral types (for example WC + WN = WR) and luminosity classes (for example O stars) have been lumped together in cases where the number of stars in a specific subclass was insufficient to warrant a special category. Within one category, the graphs are presented in order of "blueness" in the sense that the stars with the blue ultraviolet colors (with respect to V) come before redder stars. Within one spectral type and luminosity class this will generally lead to an ordering by amount of interstellar extinction. For cases where stars with different luminosities have been lumped into one category, it can easily be ascertained that the more luminous stars appear after (are redder than) dwarfs with the same spectral type and E_{B-V} . The last column of Table 2 gives an estimate of the maximum E_{B-V} within one category. It is immediately obvious that the highest reddening values occur for the earliest type stars. This is the result of a selection effect caused by the fast decrease of ultraviolet luminosities towards later spectral types. More specifically, this means that late type stars need to be very close to the sun to be measurable with OAO and therefore tend to be almost unreddened. Frequency-distributions of three ultraviolet magnitudes (1550, 2200, and 3300 \AA) as a function of intrinsic colors are presented in Figures 1 through 3. Magnitudes at 2200 \AA were estimated when possible when no ANS data were available. Those parts of the histograms corresponding to stars with $E_{B-V} > 0.20$ have been shaded.

Table 3 lists all the 531 stars in the catalogue in order of HD number, basic data, and the category to which they have been assigned. The last column specifies which remarks are applicable to that object and a key to

those remarks can be found after Table 3. The availability of ANS and/or TDI data is indicated by the entry of an asterisk in the appropriate column.

The major part of the catalogue follows Table 3 and has been labelled "Picture Gallery". The agreement between the various satellites is quite encouraging. Incidental differences can usually be attributed to variability, field of view effects or bandwidth effects. We feel this presentation in general is a tribute to the integrity of the data in the source catalogues for which thanks are due to a very large number of individuals who, for obvious practical reasons, have to remain unnamed. This work has been supported in part by NASA grant NSG-7050.

TABLE 1

Corrections Applied to the UBV, ANS and TD1 Data to bring them to the OAO-2 photometry absolute calibration. A positive number implies that the value as found in the original source catalog has been brightened: $m_{\text{OAO}} = m_{\text{source}} - \Delta \text{ mag}$

Channel	$\Delta \text{ mag}$
ANS 1550 $\overset{\circ}{\text{A}}$	0.20
ANS 1800 $\overset{\circ}{\text{A}}$	0
ANS 2200 $\overset{\circ}{\text{A}}$	0
ANS 2500 $\overset{\circ}{\text{A}}$	0
TD1 2740 $\overset{\circ}{\text{A}}$	0.175
ANS 3300 $\overset{\circ}{\text{A}}$	0.07
U	0.13
B	0.67
V	0

CATEGORY	SPECTRAL TYPE	NO. OF STARS	RANGE B-V	RANGE U-B	MAXIMUM E(B-V)	-8-
A	WR	6	-.29/+ .40	-.94/- .33		
B	subdwarfs	5	-.34/- .24	-1.26/- .99		
C	O	39	-.34/+ .51	-1.18/- .64	1.0	
D	B0	15	-.26/+ .63	-1.07/- .36	0.8	
E	B0.5	17	-.25/+ .38	-1.02/- .56	0.65	
F	B1 I-II	11	-.14/+ .94	-.95/- .18	0.9	
G	B1 III-V	17	-.24/+ .13	-1.00/- .70	0.4	
H	B1.5	12	-.23/+ .54	-.93/- .46	0.7	
I	B2 I-III	8	-.22/+ .33	-.92/- .48	0.55	
J	B2 IV-(IV-V)	23	-.23/+ .03	-.89/- .64	0.3	
K	B2 V	11	-.21/+ .25	-.88/- .46	0.5	
L	B2.5	18	-.22/+ .20	-.81/- .63	0.35	
M	B3	3	-.08/+ .53	-.79/- .32	0.65	
N	B3 IV-V	20	-.20/+ .13	-.74/- .45	0.35	
O	B4	9	-.19/- .07	-.71/- .53	0.1	
P	B5 I-IV	9	-.16/- .06	-.71/- .53	0.1	
Q	B5 V	9	-.16/- .06	-.58/- .50	0.1	
R	B6 III-IV	8	-.14/- .06	-.57/- .42	0.1	
S	B6 V	7	-.16/+ .13	-.52/- .25	0.25	
T	B7 III-IV	9	-.14/- .04	-.53/- .33	0.1	
U	B7 V	5	-.14/- .04	-.45/- .36	0.1	
V	B8 I-IV	7	-.18/- .03	-.59/- .31	0.05	
W	B8-8.5 V	11	-.12/+ .05	-.40/- .21	0.1	
X	B9-9.5	16	-.07/+ .41	-.32/- .01	0.05	
Y	A0	14	-.01/+ .56	-.20/+ .11		
Z	A1	6	-.02/+ .13	-.04/+ .07		
AA	A2	6	.00/+ .52	.04/.13		
BB	A3	7	.03/.12	.06/.12		
CC	A4-5	6	.13/.17	.10/.13		
DD	A7-8	6	.19/.54	.08/.33		
EE	F0	5	.15/.28	.05/.25		
FF	F1-2	7	.34/.51	.04/.27		
GG	F5	8	.30/.46	-.05/+ .18		
HH	F6	5	.46/.51	-.02/+ .06		
II	F7	3	.45/.52	-.06/- .04		
JJ	F8-9	9	.50/.67	.00/.55		
KK	G0	10	.54/.82	.00/.47		
LL	G1	6	.62/.81	.11/.47		
MM	G2	10	.60/1.00	.05/.64		
NN	G3-4	3	.60/.77	.11/.34		
OO	G5	10	.58/1.08	.06/.87		
PP	G7	2	.72/.92	?/.60		
QQ	G8-9	13	.80/1.40	.45/1.46		
RR	K0	11	.80/1.17	.37/1.13		
SS	K1-1.5	8	.76/1.55	.29/1.71		
TT	K2-2.5	7	.88/1.71	.58/2.00		
UU	K5-7	6	1.39/1.72	1.58/1.92		
VV	M	4	1.38/1.84	1.28/2.11		
WW	B8p-A2p	22	-.19/- .03	-.60/- .07		
XX	variables	15	-.19/+1.28	-1.01/+ .42		
YY	field of view	14	-.17/+1.75	-.93/+1.80		
ZZ	other	13				

TABLE 2

Categories in which the 531 stars are divided for presentation in the
Picture Gallery

TABLE 3

The 531 stars contained in the Picture Gallery

-9-

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
358	15	ALF AND	B9	P	*	*	WW-4	1,2,5
432	21	BET CAS	F2	III-IV	*	*	FF-5	1,5
886	39	GAM PEG	B2	IV		*	J-3	1,5
1337	65	AO CAS	O9	IIIN	*	*	XX-1	1,3
1522	74	IOT CET	K1.5	III			SS-7	1
1581	77	ZET TUC	G0	V			KK-3	
1671	82	RHO AND	F5	IV			GG-7	
2151	98	BET HYI	G1	IV	*		LL-2	5
2905	130	KAP CAS	B1	IA	*	*	F-6	6
3360	153	ZET CAS	B2	IV	*	*	J-16	5
3369	154	PI AND	B5	V	*	*	Q-4	1,6
3546	163	EPS AND	G8	III			QQ-3	
		-15° 115	B2		*		ZZ-3	4
3712	168	ALF CAS	K0	IIIA	*		RE-11	5
3817	175	32 AND	G8	III			QQ-7	
4614	219	ETA CAS	G0	V			KK-2	1
4622	220		B9	V		*	X-5	
4727	226	NU AND	B5	V		*	Q-5	1,5
5394	264	GAM CAS	B0.5	IVE		*	E-5	1,5
5737	280	ALF SCL	B8	III		*	V-2	1,6
6178	293	SIG SCL	A2	V			AA-4	
		FEIGE 11	B	P			ZZ-1	
6860	337	BET AND	M0	IIIA			VV-2	1
6920	340	44 AND	F8	V			JJ-7	
8375	396		G8	IV			QQ-2	
8538	403	DEL CAS	A5	V	*	*	CC-4	1,5
9053	429	GAM PHE	K5	IB	*		UU-3	1
9826	458	UPS AND	F8	V	*		JJ-5	1
10072	469	CHI AND	G8	III			QQ-4	
10144	472	ALF ERI	B3	VP		*	N-16	5
10307	483		G2	V	*		MM-4	
10783		UZ PSC	A2	P	*		WW-21	1
11415	542	EPS CAS	B2	P		*	ZZ-4	6
11443	544	ALF TRI	F6	IV		*	HH-4	1,5
11636	553	BET ARI	A5	V		*	CC-3	1,5
11937	566	CHI ERI	G5	IV			OO-6	1
12235	582	112 PSC	D G1				LL-4	
12311	591	ALF HYI	F0	V			EE-3	
12929	617	ALF ARI	K2	IIIB			TT-2	5
13161	622	BET TRI	A5	III		*	CC-5	1,6
13174	623	14 ARI	F2	III			FF-4	1
13611	649	XII CET	G8	II CN2			QQ-6	
14055	664	GAM TRI	A0	V	*	*	Y-6	5, AlVnn?
14633			O8		*		C-11	
15008	705	DEL HYI	A2	V	*	*	AA-2	6

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
15089	707	IOT CAS	A5	P		*	ZZ-13	1
15130	708	RHO CET	B9	V		*	X-11	
		FEIGE 24	DA	E	*		B-2	
16582	779	DKL CET	B2	IV	*	*	J-11	1,2,6
16908	801	35 ARI	B3	V	*	*	N-12	6
16978	806	EPS HYI	B9	III		*	X-4	
17081	811	PI CET	B7	V	*	*	U-2	
17361	824	39 ARI	K1	III	*		SS-6	
17573	838	41 ARI	B8	V		*	W-2	1
18322	874	ETA ERI	K1	III-IV			SS-5	
18622/3	897/8	THT ERI	A3	V		*	BB-7	1
18784	907	RHO1ERI	G5				OO-10	
19121	926		K0	III			RR-10	
20365	987	29 PER	B3	V	*		N-17	
20391			A1	V	*		Z-6	
20418	989	31 PER	B5	IV	*	*	P-7	
20701			A1	V	*		Z-5	
20756	1005	TAU ARI	B5	IV	*	*	P-5	
20809	1011		B4	V	*	*	O-9	
20961			A0	V	*		Y-7	B9.5V?
21091			A0	V	*		Y-5	
21181			B9	V	*		X-7	
21278	1034		B4	V		*	O-8	
21291	1035		B9	IA	*		X-16	1
21362	1037		B7	VN	*		U-3	
21389	1040		A0	IA	*		Y-14	
21428	1044	34 PER	B5	V	*	*	Q-7	1
21455	1047		B6	V			S-7	1
21481			A0	V	*		Y-10	
21551	1051		B8	IV	*	*	V-5	
21641			B9	V	*		X-1	1
21665	1060		G5				OO-9	
21672			B8	V	*		W-9	
21699	1063		B8	III	*	*	V-1	6
21856	1074		B1	V		*	G-12	
22049	1084	EPS ERI	K2	V			TT-1	1
22136			B8	V	*		W-7	
22192	1087	PSI PER	B5	VE	*	*	Q-8	6
22203	1088	TAU5ERI	B8	V		*	W-4	1
22401			A0	V	*		Y-4	
22928	1122	DEL PER	B5	III	*	*	P-8	1,5
23227	1134	DEL FOR	B5	IV	*	*	P-1	
23249	1136	DEL ERI	K0	IV			RR-4	
23288	1140	16 TAU	B7	IV	*		T-6	1
23302	1142	17 TAU	B6	III	*		R-5	1

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
23324	1144	18 TAU	B8	V	*	*	W-5	
23338	1145	19 TAU	B6	IV	*		R-6	1
23401	1148	GAM CAM	A3	IV		*	BB-1	1
23408	1149	20 TAU	B7	III	*		T-7	
23480	1156	23 TAU	B6	IVNM	*	*	R-8	1
23630	1165	ETA TAU	B7	III	*	*	T-9	1
23850	1178	27 TAU	B8	III	*		V-6	1
23862	1180	28 TAU	B8	P	*		XX-11	1
24398	1203	ZET PER	B1	IB		*	F-5	1,5
24534	1209	X PER	09.5EP			*	C-34	1
24626	1214		B6	V		*	S-1	
24760	1220	EPS PER	B0.5III		*	*	E-6	1,2,5
24912	1228	XI PER	07.5		*		C-19	5
25267	1240	TAU9ERI	A0	III	*	*	WW-7	1,6,A0IIIP?
26965/76	1325	40 ERI	K1	V			YY-10	1
26976		40 ERIB	A				YY-9	1
27290	1338	GAM DOR	F5	V		*	GG-1	1
27376	1347	41 ERI	B2.5V		*	*	W-3	1,6
28873	1443	DEL CAE	B2	IV-V	*		J-12	6
29139	1457	ALF TAU	K5	III	*		UU-5	1,5
30614	1542	ALF CAM	09.5IA		*	*	C-31	5
31726	1595		B1	V	*	*	G-6	6
31964	1605	EPS AUR	A8	IA	*		DD-6	1,6
31975	1606		F8	V			JJ-1	
32343/57	1622/3	11/12CAM	B2.5VE		*	*	L-14	1
32630	1641	ETA AUR	B3	V	*	*	N-5	2,5
32650	1643		A0	P	*	*	WW-8	
33262	1674	ZET DOR	F7	V			II-3	
33802	1696	IOT LEP	B8	V	*	*	W-1	1
33904	1702	MU LEP	B9	IIIP	*	*	WW-3	6
33949	1705	KAP LEP	B8	V	*	*	W-6	1
34029	1708	ALF AUR	G8	III+F	*	*	QQ-1	1,5,†
34078	1712	AE AUR	09.5V		*	*	XX-4	1
34085	1713	BET ORI	B8	IA	*	*	V-7	2,5
34452	1732		A0	P		*	WW-1	
34656			07	IF	*	*	C-22	†
34759	1749	RHO AUR	B5	V	*	*	Q-1	
34816	1756	LAM LEP	B0.5IV		*	*	E-1	5
34863	1757	NU LEP	B7	IVNM	*	*	T-2	
34989	1763		B1	V	*	*	G-10	
35072	1767	ZET PIC	F8	III			JJ-4	
35149	1770	23 ORI	B1	VN	*	*	G-15	1
35299	1781		B2	V	*	*	K-1	
35411	1788	ETA ORI	B0.5VNM		*	*	YY-5	1,2,5
35439	1789	25 ORI	B1	VN	*	*	G-8	1,5

HD	HR	NAME	SP	LUM/PKC	AMS	TD-1	CATEGORY	REMARKS
35468	1790	GAM ORI	B2	III		*	I-2	1,5
35497	1791	BET TAU	B7	III		*	T-3	1,5
35671	1808	115 TAU	B5	V		*	Q-6	1
35708	1810	114 TAU	B2.5IV			*	L-8	1
35921		LY AUR	09.5III		*		XX-3	1
36079	1829	BET LEP	G0	III	*		KK-10	1,5, G5III?
36285	1840		B2	IV-V	*	*	J-14	
36485/6	1851/2	DEL ORI	09.5II			*	C-14	1,5
36512	1855	UPS ORI	B0	V	*	*	D-1	5
36591	1861		B1	V	*	*	G-9	1,2
36673	1865	ALF LEP	F0	IB	*	*	EE-5	1,5
36822	1876	PHI ORI	B0.5IV-V		*	*	E-9	5
36861/2	1879/80	LAM ORI	08			*	C-13	1,5
37020/42	1893/7	THT ORI	06EP-08		*		YY-3	1
37043	1899	IOT ORI	09	III	*	*	C-7	1,5
37128	1903	EPS ORI	B0	IA		*	D-6	1,5
37129			B2	VP		*	K-7	
37202	1910	ZET TAU	B4	IIIP		*	O-1	1,5
37438	1928	125 TAU	B3	IV	*	*	N-15	1
37468	1931	SIG ORI	09.5V		*	*	C-8	1,2,5
37490	1934	OMG ORI	B2	IIIE	*	*	I-4	5
37507	1937	49 ORI	A4	IV		*	CC-1	1
37742/3	1948/9	ZET ORI	09.5IB			*	C-6	1,5
37795	1956	ALF COL	B7	IV	*	*	T-4	1,6
37903			B1.5V		*		YY-6	1
38392/3	1982/3	GAM LEP	F6	V			HH-1	1
38622	1993	133 TAU	B2	IV-V	*	*	J-19	1
38666	1996	MU COL	09.5IV		*	*	C-4	5
38678	1998	ZET LEP	A3	V	*	*	BB-3	6
38771	2004	K/P ORI	B0.5IA			*	E-8	5
38899	2010	134 TAU	B9	IV	*	*	X-2	1
39060	2020	BET PIC	A5	III		*	CC-2	6
39091	2022	PI MEN	G3	IV			NN-1	
39317	2033	137 TAU	B9	P	*		WW-19	
39640	2049		G8	III			QQ-11	
39801	2061	ALF ORI	M1-2IA-IB		*		VV-3	1
39844	2084	EPS DOR	B6	V	*	*	S-4	6
40111	2084	139 TAU	B1	IB	*	*	F-2	5
40183	2085	BET AUR	A2	V	*	*	AA-3	1,5
40312	2085	THT AUR	B9.5P		*	*	WW-17	1,5
41117	2135	CHI2ORI	B2	IA	*	*	I-7	
41692	2154		B5	IV	*		P-6	1
41695	2155	THT LEP	A1	V	*	*	Z-4	
41753	2159	NU ORI	B3	V	*	*	N-6	1,5
42087	2173	3 GEM	B2.5IB		*	*	L-18	1,6

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
42560	2199	XI ORI	B3	IV	*	*	N-10	1,5
42933	2212	DEL PIC	B0.5	IV	*	*	E-4	1,6
43107	2221	NU DOR	B8	V	*	*	W-10	6
43285	2231		B6	V		*	S-3	6
43834	2261	ALF MEN	G5	V			00-3	
44743	2294	BET CMA	B1	II-III		*	G-2	1,5
45348	2326	ALF CAR	F0	IB	*	*	EE-4	5
45542	2343	NU GEM	B6	III	*	*	R-3	1
45546	2344	10 MON	B2	V	*	*	K-4	1,6
45725/7	2356/8	BET MON	B3	VE	*	*	N-11	1,5
45796	2360		B6	V	*	*	S-6	
45910		AX MON	B2	F	*		XX-9	1,†
46116	2377	PI2 DOR	G5				00-8	
46150			06		*		YY-2	1
46328	2387	XI1 CMA	B1	III	*	*	G-1	1,5
46588	2401		D	F6			HH-2	1
46966			08.5	V	*		C-21	
47105	2421	GAM GEM	A0	IV	*	*	Y-12	1,5, A1IV?
47129	2422		08	F	*	*	C-27	1,6
47205	2429	NU2 CMA	K1	IV	*		SS-4	
47240	2432		B1	II	*	*	F-7	
47839	2456	15 MON	07		*	*	C-9	1,5
48099	2467		05.5		*	*	C-20	6, 06.5V?, †
48329	2473	EPS GEM	G8	IB	*		QQ-13	1,5
48915	2491	ALF CMA	A1	V		*	Z-1	1,5
49798			06				C-2	1
50013	2538	KAP CMA	B1.5	IVNE	*	*	H-7	2,3,6
50806	2576		G5	IV			00-2	
50877	2580	OMI1CMA	K2.5	IAB	*		TT-7	1
50896	2583	EZ CMA	WN5		*	*	A-2	1,5
52057			B8	V	*		W-11	
52089	2618	EPS CMA	B2	II		*	I-1	1,5
52877	2646	SIG CMA	K7	IB	*		UU-6	1, M0Iab?
52918	2648	19 MON	B1	IV	*	*	G-14	
53138	2653	OMI2CMA	B3	IA	*	*	M-1	3,6
53705/6	2667/8		G0				KK-8	1
53975	2679		08		*	*	C-17	
54605	2693	DEL CMA	F8	IA	*		JJ-9	
54662	2694		06.5		*	*	C-25	
54893	2702		B2	IV-V	*	*	J-18	
56139	2749	ONG CMA	B2	IV-VE	*	*	J-22	1,6
56986	2777	DEL GEM	F2	IV	*	*	FF-3	1, F0-3IV?
57061	2782	TAU CMA	09	IB	*	*	C-15	1,6
58350	2827	ETA CMA	B5	IA	*	*	P-9	1,2,5
58715	2845	BET CMI	B8	V	*	*	W-8	1,6

HD	HR	NAME	SP LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
61421	2943	ALF CMI	F5 IV-V	*	*	GG-6	1,5
62150			B3 IA	*		H-3	
62509	2990	BET GEM	K0 IIIB			RR-7	1
63271	3023		B2 IV-V	*	*	J-15	
64503	3084		B2.5V	*	*	L-5	6
64740	3089		B1.5VP	*	*	H-1	
64760	3090		B0.5IB	*	*	E-10	6
66811	3165	ZET PUP	O5 F		*	C-3	5
		+75°325	O5 P	*		C-1	
67797	3192	16 PUP	B5 IV	*	*	P-2	6
68217	3204		B2 IV-V	*	*	J-17	
68243/73	3206/7	GAM VEL	4C8		*	A-1	1,5
68351	3215	15 CNC	A0 P	*	*	WW-18	1
68457	3221		D A7			DD-4	1
70011	3268	LAM CNC	B9 V			X-8	
70930	3294		B1.5III	*	*	H-8	1,6,B3IV?
72905	3391	PI1 UMA	G0 V	*		KK-6	
74198	3449	GAM CNC	A1 V		*	Z-3	1
74280	3454	ETA HYA	B3 V	*	*	N-1	
74521	3465	49 CNC	A0 P	*	*	WW-16	AlpEuCr?
74753	3476	D VEL	B0 IIIN	*	*	D-5	6
75821	3527		B0 III	*	*	D-4	1
76644	3569	IOT UMA	A7 IV	*	*	DD-1	1
78316	3623	KAP CNC	B8 IIIP		*	V-3	1
78418	3626	75 CNC	D G3			NN-2	1
80007	3685	BET CAR	A0 III			Y-11	5
81809	3750		G2 V			MM-7	1
82210	3771	24 UMA	G4 III-IV	*		NN-3	G2-4III-IV?
82328	3773	THT UMA	F6 IV	*		HH-3	1
82621	3799	26 UMA	A2 V		*	AA-1	
84441	3873	EPS LEO	G1 II			LL-6	
87901	3982	ALF LEO	B7 V	*	*	U-5	1,5
88230			D M0			VV-1	1
89822	4072		A0 P	*	*	WW-13	1
91316	4133	RHO LEO	B1 IB	*	*	F-3	1,6,B1Iab?
91465	4140	PP CAR	B4 VNE		*	O-5	1,5
93030	4199	THT CAR	B0.5VP	*	*	E-2	6
93163	4204		B2.5V	*		L-16	
93194	4205		B4 IVN		*	O-6	
93521			O9 VP	*	*	C-12	
93607	4222		B3 V	*		N-8	
93845	4234	DEL2CHA	B2.5IV	*	*	L-3	
95128	4277	47 UMA	G0 V			KK-9	
95418	4295	BET UMA	A1 V		*	Z-2	5
99953			B2 IA			I-6	

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
100340		+6°2461	B0				D-3	
102647	4534	BET LEO	A3	V		*	BB-4	1,5
102776	4537		B3	V			N-13	
103287	4554	GAM UMA	A0	V	*	*	Y-8	6
105435	4621	DEL CEN	B2	IVNE		*	J-9	1,6
106420			B7	V	*		U-4	
106591	4660	DEL UMA	A3	V	*	*	BB-2	1
106903/25	4763/4	GAM CRU	M3	II			YY-14	1
109358	4785	BET CVN	G0	V	*		KK-5	1
109387	4787	KAP DRA	B6	IIIP	*	*	R-2	1
		FEIGE 65	SDB2				B-4	
109995			A0	V			Y-13	
111123	4853	BET CRU	B0.5	IIII			E-3	1,5
112078	4897	LAM CRU	B4	VN	*	*	O-3	5
112412/3	4914/5	ALF CVN	A	P		*	WW-11	1,6
113001			F2	V + 09			C-5	1
116658	5056	ALF VIR	B1	V			G-4	1,5
118716	5132	EPS CEN	B1	III			G-5	1,5
120198	5187	84 UMA	A2	P	*		WW-22	
120307	5190	NU CEN	B2	IV	*	*	J-1	1,2,5
120315	5191	ETA UMA	B3	V		*	N-4	5
120324	5193	MU CEN	B2	IV-VE	*	*	J-8	1,2,5
120709/10	5210/1	3 CEN	B5	III	*	*	P-4	1,6
121263	5231	ZET CEN	B2.5	IV		*	L-1	1,5
121370	5235	ETA BOO	G0	IV	*		KK-7	1,5
121743	5248	PHI CEN	B2	IV	*	*	J-5	5
121790	5249	UPS1CEN	B2	IV-V	*	*	J-6	5
122451	5267	BET CEN	B1	III			G-3	1,5
122879	5281		B0	IA	*		D-9	
122980	5285	CHI CEN	B2	V	*	*	K-2	6
123299	5291	ALF DRA	A0	III	*	*	Y-2	1
124897	5340	ALF BOO	K2	IIIP	*		TT-5	5
125238	5354	IOT LUP	B2.5	IV			L-7	5
125823	5378	A CEN	B7	IIIP		*	ZZ-6	1,5
127762	5435	GAM BOO	A7	III		*	DD-3	1,5
127972	5440	ETA CEN	B1.5	VN	*	*	H-5	1,2,5
128620/1	5459/60	ALF CEN	G2	V		*	MM-9	1,5
128898	5463	ALF CIR	F0	III		*	EE-1	1
129056	5469	ALF LUP	B1.5	IIII	*		H-6	1,5
129078	5470	ALF APS	K5	III			UU-2	
129116	5471		B3	V		*	N-3	6
129926	5497	54 HYA	F1	+ F9			FF-1	1
130095			B8		*		ZZ-9	
133029	5597		A0	P	*		WW-14	1
133937	5625		B7	V	*		U-1	

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
133955	5626	LAM LUP	B3	V	*	*	N-2	1,6
135240	5664	DEL CIR	08.5V		*		YY-4	1,6
135591	5680		07	I	*	*	C-16	1,5,07.5IIIf?
136298	5695	DEL LUP	B1.5IV		*	*	H-3	1,2,6
136504	5708	EPS LUP	B2	IV-V	*	*	J-10	1,2,5
136664	5712	PHI2LUP	B4	V	*	*	O-2	6
137432	5736		B4	VP	*	*	O-4	1
138485	5764	ZET LIB	B2	VN	*	*	K-6	1
138690	5776	GAM LUP	B2	IV	*	*	J-7	1,6
138749	5778	THT CRB	B6	VNN	*	*	S-5	1,6
139063	5794	UPS LIB	K5	III			UU-1	1
140573	5854	ALF SER	K2	III			TT-3	1
141527	5880	R CRB	G0	P			XX-14	1
141637	5885	1 SCO	B1.5VN		*	*	H-9	5
142091	5901	KAP CRB	K1	IVA			SS-2	1
		+33°2642	B2	IV	*		J-20	
142096	5902	LAM LIB	B2.5V		*	*	L-12	6
142114	5904	2 SCO	B2.5VN		*	*	L-11	1,6
142184	5907		B2.5V		*	*	L-13	1
142301	5912	3 SCO	B8	IIIP	*	*	V-4	
142373	5914	CHI HER	F9	V	*		JJ-3	
142669	5928	RHO SCO	B2	IV-V	*	*	J-13	1,3,5
142883	5934		B3	V	*	*	N-19	1
142983	5941	48 LIB	B5	IIIP	*	*	XX-10	1,6
142990	5942		B4	IVP	*	*	O-7	
143018	5944	PI SCO	B1	V		*	G-7	1,5
143118	5948	ETA LUP	B2.5IV		*	*	L-2	1,2,5
143275	5953	DEL SCO	B0.5IV			*	E-7	1,5
143699	5967		B6	IV	*	*	R-1	
143761	5968	RHO CRB	G2	V	*		MM-2	1
143807	5971	IOT CRB	A0	II-III	*	*	Y-1	
144206	5982	UPS HER	B9	P	*	*	WW-9	6, B9IIIIHgMn?
144217/8	5984/5	BET SCO	B0.5V			*	E-11	1,5
144334	5988		B9	III	*	*	ZZ-12	B8p?
144470	5993	OMG1SCO	B1	V	*	*	G-13	6,†
144661	5998		B7	IIIP	*	*	T-5	
144844	6003		B9	V	*		X-3	
145482	6028	13 SCO	B2	V	*	*	K-5	5
145501/2	6026/7	NU SCO	B2	IVP	*	*	J-23	1,6,†
146233	6060	18 SCO	D	G1	*		LL-3	1
147165	6084	SIG SCO	B1	III	*	*	G-16	1,5,†
147394	6092	TAU HER	B5	IV	*	*	P-3	1,5
147675	6102	GAM APS	K0	IV			RR-3	
147677	6103	XI CRB	K0	III	*		RR-8	1
147889			B2	V	*		YY-8	†

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
147933/4	6112/3	RHO OPH	B2	IV	*	*	YY-7	1,†
148184	6118	CHI OPH	B1.5	VE	*	*	H-10	1,6
148387	6132	ETA DRA	G8	III	*		QQ-9	1,5
148605	6141	22 SCO	B2	V	*	*	K-3	5
148688	6142		B1	IA ⁺	*	*	F-8	1
148703	6143		B2	III	*	*	I-3	5
148856	6148	BET HER	G8	III	*		QQ-8	1,5
148937			06.5	F			C-36	
149038	6155	MU NOR	B0	IA	*	*	D-13	6,09.7 Iab?
149438	6165	TAU SCO	B0	V		*	D-2	5
149630	6168	SIG HER	B9	V	*	*	X-13	A1Vn?
149757	6175	ZET OPH	09.5	V		*	C-23	5
149822	6176		A0	P	*		WW-20	
150265		W UMI	A3				XX-13	1
150680	6212	ZET HER	G1	IV	*		LL-5	1,5
150898	6219		B0.5	IA	*	*	E-12	B0 Iab?
150997	6220	ETA HER	G7	III-IV	*		PP-2	1
		+13°3224	B1	P	*		XX-8	1
151804	6245		08	IFP	*	*	C-29	6
152235	6261		B1	IA	*		F-10	†
152236	6262		B1.5	IA ⁺ P	*		H-11	
154368	6347		09.5	IA	*		C-39	1
155763	6396	ZET DRA	B6	III	*	*	R-7	5
157056	6453	THT OPH	B2	IV	*	*	J-4	1,2,6
157246	6462	GAM ARA	B1	IB	*	*	F-1	1,2,6
158408	6508	UPS SCO	B2	IV	*	*	J-2	6
158427	6510	ALF ARA	B2	VNE	*	*	K-8	1,2,3,6
158633	6518		D	K1			SS-1	
158926	6527	LAM SCO	B1.5	IV		*	H-2	1,5
159181	6536	BET DRA	G2	IB-IIA	*		MM-10	1,5
159561	6556	ALF OPH	A5	III	*	*	CC-6	5
160578	6580	KAP SCO	B1.5	III		*	H-4	1
160762	6588	IOT HER	B3	V	*	*	N-9	1,6
160922	6596	OMG DRA	F5	V	*		GG-5	1
161471	6615	IOT1 SCO	F2	IA	*		FF-7	1,5
161868	6629	GAM OPH	A0	V	*	*	Y-9	
162374	6647		B8			*	ZZ-8	
163506	6685	89 HER	F2	IA	*		FF-6	1
163588	6688	XI DRA	K2	III	*		TT-4	
164058	6705	GAM DRA	K5	III			UU-4	1
164794	6736	9 SGR	05		*		YY-1	1
165341	6752	70 OPH	K0	V			RR-2	1
165634	6766		K0				RR-5	
165763			WC	6	*		A-3	†
166014	6779	OMI HER	B9	V	*	*	X-10	1, B9.5 III-V?

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
167264	6822	15 SGR	B0	IA	*	*	D-7	
167665	6836		G0	V			KK-1	
168021	6848		B0	IB	*		D-14	1
168905	6875		B2.5VN		*	*	L-6	1,B2-3Vn?
169022	6879	EPS SGR	B9	IV		*	X-14	1,6
169454			B1	IA	*		F-11	†
170153	6927	CHI DRA	F7	V		*	II-2	1,5
170580	6941		B2	V	*		K-10	1
172167	7001	ALF LYR	A0	V	*	*	Y-3	1,2,5,†
173524	7049	46 DRA	A	P	*	*	WW-10	1,B9.5pHg?
174107		V603AQL	Q		*		XX-2	1
174237	7084		B2.5V		*	*	L-10	B3Ve?,†
176051	7162		G0	V			KK-4	1
176304			B2	VP	*		K-11	
177724	7235	ZET AQL	B9	V	*	*	X-15	1,5,A0V:n?
178911	7272		D G1				LL-1	1
179406	7279	20 AQL	B3	V	*	*	N-20	
180711	7310	DEL DRA	G9	III	*		QQ-12	1,5
182989		RR LYR	A-F				XX-12	1
183056	7395	4 CYG	A0	P	*	*	WW-5	1,B9pS1?
184279			B0.5IV		*		E-15	†
184905			A0	P	*		WW-15	
184915	7446	KAP AQL	B0.5III		*	*	E-14	6
185144	7462	SIG DRA	K0	V			RR-1	1
185395	7469	THT CYG	F5	IV	*		GG-3	1
186882	7528	DEL CYG	B9.5III		*	*	X-9	1,5
187642	7557	ALF AQL	A7	IV-V	*	*	DD-2	1,5
188209	7589		O9.5IA		*	*	C-24	5
188376	7597	OMG SGR	D G5				OO-4	
188665	7608	23 CYG	B5	V	*	*	Q-3	
E226868		V1357CYG	B0	IB	*		XX-6	1,09.7Ia?
189567	7644		G2	V			MM-6	
189687	7647	25 CYG	B3	IV		*	N-14	
190248	7665	DEL PAV	G5	IV			OO-5	
190603	7678		B1.5IA		*		H-12	1,6
192163			WN6		*		A-5	6
192486	7729		F2	V			FF-2	
192577/8	7735	31 CYG	K2	II	*		XX-15	1,K2+B3V
192660			B0	IA	*		D-15	
192696	7740	33 CYG	A3	IV-V	*	*	BB-6	
192909/10	7751	32 CYG	K3	IB-II+B			YY-11	1
193237	7763	P CYG	B1	PE	*	*	XX-7	1,6
193322	7767		O9	V	*	*	C-30	1,6,08.5-9III-
193432	7773	NU CAP	B9	V	*	*	X-6	1 V:n?
193664	7783		G5	V			OO-1	

HD	HR	NAME	SP	LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
193793			WC6+06		*		A-6	1,6,WC6-7+05-6?,†
193924	7790	ALF PAV	B2.5V			*	L-4	1,6
194093	7796	GAM CYG	F8 IB		*		JJ-8	1,5
195556	7844	OMG1 CYG	B2.5IV		*	*	L-17	1,5
195627	7848	PHI1PAV	F0 V		*		EE-2	
196178	7870		B8 P		*	*	WW-2	1,B8-9pS1?
196662	7889	TAU CAP	B6 III		*	*	R-4	1,B5III?
196761	7898		D G7				PP-1	
		L116-79	DA				ZZ-2	1
197345	7924	ALF CYG	A2 IA		*	*	AA-5	1,5
197770	7940		B2 III		*		I-5	
197989	7949	EPS CYG	K0 -III				RR-6	1,5
198084	7955		F8 IV		*		JJ-6	1
198183	7963	LAM CYG	B5 V		*	*	Q-9	1,B6IV?
198478	7977	55 CYG	B3 IA		*	*	M-2	1
199081	8001	57 CYG	B5 V		*	*	Q-2	1,5
199216			B1 II		*		F-9	
199260	8013		F8 V				JJ-2	
199579	8023		O6		*	*	C-26	1,6,06.5III?
199684	8031		F5 V				GG-2	
199728	8033	20 CAP	A0 P			*	WW-12	
200310	8053	60 CYG	B1 VN		*	*	G-11	1,5
200905	8079	XI CYG	K4.5IB-II		*		YY-12	
201647	8100		F7 V				II-1	
201908	8112	77 DRA	B9			*	ZZ-10	
202109	8115	ZET CYG	G8 II CN1		*		QQ-10	1,5
202214	8119		B0 V		*	*	D-10	1,6
202904	8146	UPS CYG	B2 VE		*	*	K-9	1,5
203064	8154	68 CYG	O8 N		*	*	C-18	5,07.5III:nf?
203245	8161		B6 V		*	*	S-2	
203280	8162	ALF CEP	A7 IV-V		*	*	DD-5	1,5
204172	8209	69 CYG	B0 IB		*	*	D-12	1
204381	8213	36 CAP	G G5		*		OO-7	
205139	8243		B1 IB		*	*	F-4	†
205637	8260	EPS CAP	B2.5VP		*	*	L-9	1,3,6
206165	8279	9 CEP	B2 IB		*	*	I-8	
206267	8281		O6		*	*	C-33	1
206301	8283	42 CAP	G2 IV				MM-8	1
206672	8301	PI1 CYG	B3 IV		*	*	N-18	1
206697		SS CYG	SDBE+DG5				B-5	1
206773			B0 VPE		*	*	D-11	
206778	8308	EPS PEG	K2 IB		*		TT-6	1
207129	8323		G2 V				MM-5	1
207198	8327		O9 II		*	*	C-38	†
207260	8334	NU CEP	A2 IA		*		AA-6	

HD	HR	NAME	SP LUM/PEC	ANS	TD-1	CATEGORY	REMARKS
207330	8335	PI2 CYG	B2.5III	*	*	L-15	1,6
207757		AG PEG	B EP	*		XX-5	1
207793			B0.5III	*		E-16	
		+28°4211	O P	*		B-1	Sd07p?
208057	8356	16 PEG	B3 V	*	*	N-7	
208816	8383	VV CEP	M2 IAEP			YY-13	1
208905			B1 VP	*	*	G-17	1
		+25°4655	SD06	*		B-3	
209339	8399		B0 IV	*	*	D-8	1
209409	8402	OMI AQR	B7 IVE	*	*	T-8	†
209481	8406	14 CEP	O9 V	*	*	C-28	1,08.5III?
209952	8425	ALF GRU	B7 IV		*	T-1	1,5
209975	8428	19 CEP	O9.5IB	*	*	C-32	1,5
210459	8454	PI PEG	F5 II-III			GG-8	
210745	8465	ZET CEP	K1.5IB	*		SS-8	
210839	8469	LAM CEP	O6 F	*	*	C-35	6,06Inf p?
210855	8472		F6 V			HH-5	1
212076	8520	31 PEG	B2 IV-V	*	*	J-21	3
212454	8535		B8		*	ZZ-7	6
213087	8561	26 CEP	B0.5IB	*	*	E-17	
214680	8622	10 LAC	O9 V	*	*	C-10	1,5,08III?
214419		CQ CEP	O7 + WR	*		A-4	1
216956	8728	ALF PSA	A3 V	*	*	BB-5	5
217086			O7 VN	*		C-37	†
217675	8762	OMI AND	B6 + A2P		*	ZZ-5	1,6
217833	8770		B9		*	ZZ-11	1
217906	8775	BET PEG	M2.5II-III	*		VV-4	1
218045	8781	ALF PEG	B9 V	*	*	X-12	5,B9-9.5III?
218376	8797	1 CAS	B0.5IV	*	*	E-13	6,B0.5III?
218804	8825	6 AND	F5 IV			GG-4	
221345	8930	14 AND	K0 III			RR-9	
222107	8961	LAM AND	G8 III-IV			QQ-5	1
222404	8974	GAM CEP	K1 IV	*		SS-3	
223640	9031	108 AQR	A0 P	*		WW-6	1,A0pS1?
224930	9088	85 PEG	G2 V			MM-3	1
225239	9107		G2 V			MM-1	

KEY TO REMARKS TO TABLE 3

- 1 comment in OAO-2 Photometry Catalog; see Code et al. 1980 (Table 2 and/or Table 4)
- 2 large (>20%) alinearity correction in some or all of the ANS channels
- 3 ANS observations at different epochs indicate variability
- 4 single ANS observation
- 5 observed by OAO-2 Spectrometers; see Code and Meade (1979)
- 6 observed by one OAO-2 Spectrometer only; see Meade and Code (1980)
- † see additional comments

ADDITIONAL COMMENTS FOR TABLE 3

HD	34029	Alf Aur	TD1 catalog erroneously gives $B-V=0.08$; should be $B-V=0.80$
	34656		rather deep 2200 Å feature for $E_{B-V} = 0.34$
	45910	AX Mon	Roman, N.G. 1978, <u>A.J.</u> , <u>83</u> , 172: shell star; Sp. B2Ibe; variable 2200 Å indicated
	48099		rather strong 2200 Å feature for adopted $E_{B-V} (=0.27)$
	144470	Omg ¹ Sco	low far UV extinction ($E_{B-V} = 0.21$)
	145501/2	Nu Sco	low far UV extinction
	147165	Sig Sco	low far UV extinction
	147889		deep 2200 Å feature for $E_{B-V} = 1.08$; close to Rho Oph
	147933/4	Rho Oph	probable scattered light contribution
	152235		possible contamination in OAO Stellar 4 (1550, 1430, 1330 Å) from HD 152219 (~8' away, 09.5IV, $V = 7.62$)
	165763		variable extinction? ANS observations give $E_{B-V} = 0.35$ from 2200 Å feature
	169454		$E_{B-V} = 1.13$ from UBV photometry but only 0.75 from 2200 Å feature
	172167	Alf Lyr	ANS observations partly out of range of non-linearity table
	174237		E_{B-V} from UBV photometry ≈ 0.14 , but no 2200 Å feature
	184279		very blue ANS (15-18) color; star is variable: Dahn, C.C. and Guetter, H. 1973, <u>Ap.J.</u> , <u>179</u> , 551
	193793		high UV extinction and deep 2200 Å feature for $E_{B-V} = 0.60$, (Koornneef, J. and Sitko, M.L. 1979, <u>23</u> , 129.)
	205139		very deep 2200 Å feature for $E_{B-V} = 0.28$
	207198		rather small 2200 Å feature for $E_{B-V} = 0.62$
	209409	Omi Aqr	variable according to TD1 catalog; appears confirmed by UV photometry

217086

very blue ANS (15-18) color; possible contamination
in OAO Stellar 4 (1550, 1430, 1330 Å) from HD 217035
(~9' away, BOV, $V = 7.74$) or HD 217061 (~8' away, B1V,
 $V = 8.77$)

REFERENCES

- Allen, C.W. 1973, Astrophysical Quantities, Athlone Press, London.
- Code, A.D. and Meade, M.R. 1979, Ap. J. Suppl., 39, 195.
- Code, A.D., Holm, A.V. and Bottemiller, R.L. 1980, Ap. J. Suppl., submitted.
- Dahn, C.C. and Guetter, H. 1973, Ap. J., 179, 551.
- Fernie, J.D. 1962, Ap. J., 135, 298.
- Gilra, D. P. 1979, R O G - Note 79-13.
- Gilra, D.P., Jamar, C., Koornneef, J. and Wesselius, P.R. 1980, in preparation.
- Hoffleit, D. 1964, Catalogue of Bright Stars, (New Haven: Yale University Observatory; 3rd Ed.).
- Jamar, C., Macau-Hercot, D., Monfils, A., Thompson, G.I., Houziaux, L. and Wilson, R. 1976, ESA Document SR-27.
- Koornneef, J. and Sitko, M.L. 1979, Ap. J., 234, 129.
- Macau-Hercot, D., Jamar, C., Monfils, A., Thompson, G.I., Houziaux, L. and Wilson, R. 1978, ESA Document SR-28.
- Meade, M.R. and Code, A.D. 1980, Ap. J. Suppl., (February issue).
- Roman, N.G. 1978, A. J., 83, 172.
- Wesselius, P.R., van Duinen, R.J., Aalders, J.W.G. and Kester, D. 1980, Astron. and Astrop., in press.
- Wu, C.-C., Faber, S.M., Gallagher, J.S., Peck, M. and Tinsley, B.M. 1980, Ap. J., submitted.

Jan Koornneef and Arthur D. Code: Washburn Observatory, University of
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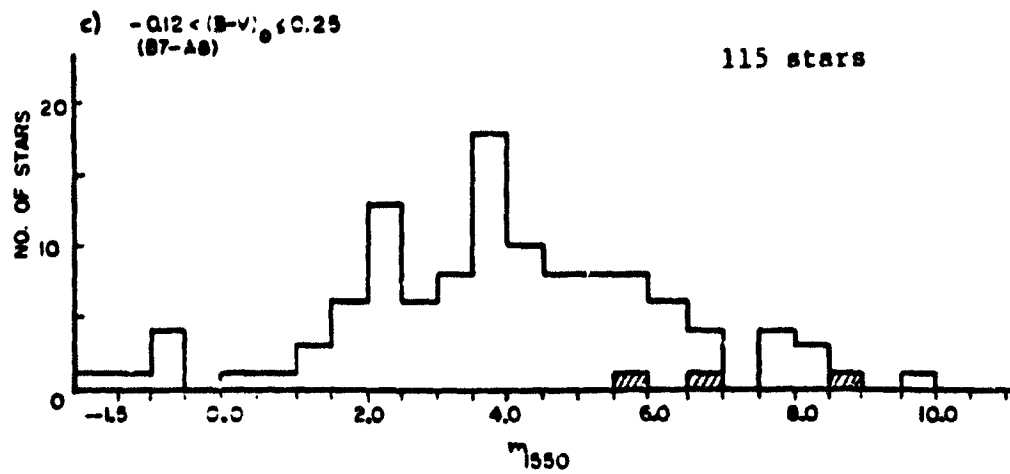
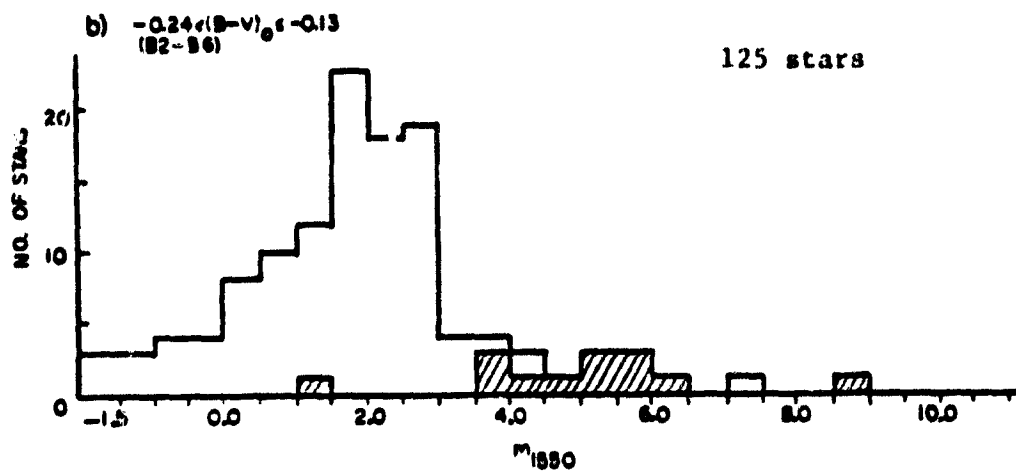
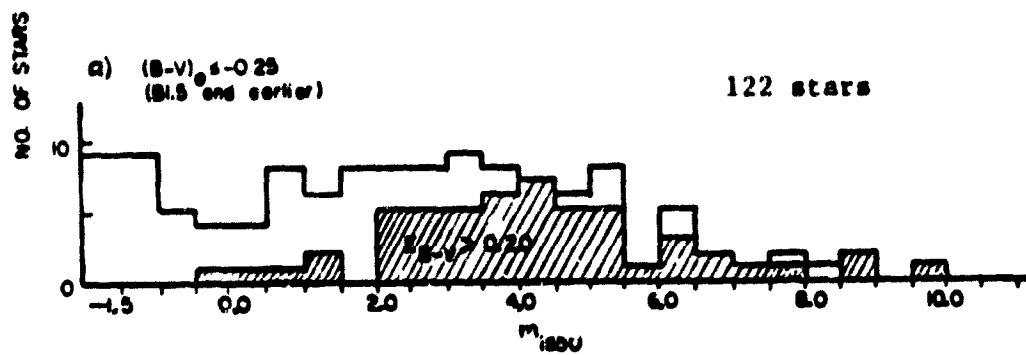
Marilyn R. Meade: Space Astronomy Laboratory, University of Wisconsin,
Chamberlin Hall, 1150 University Avenue, Madison, Wisconsin 53706.

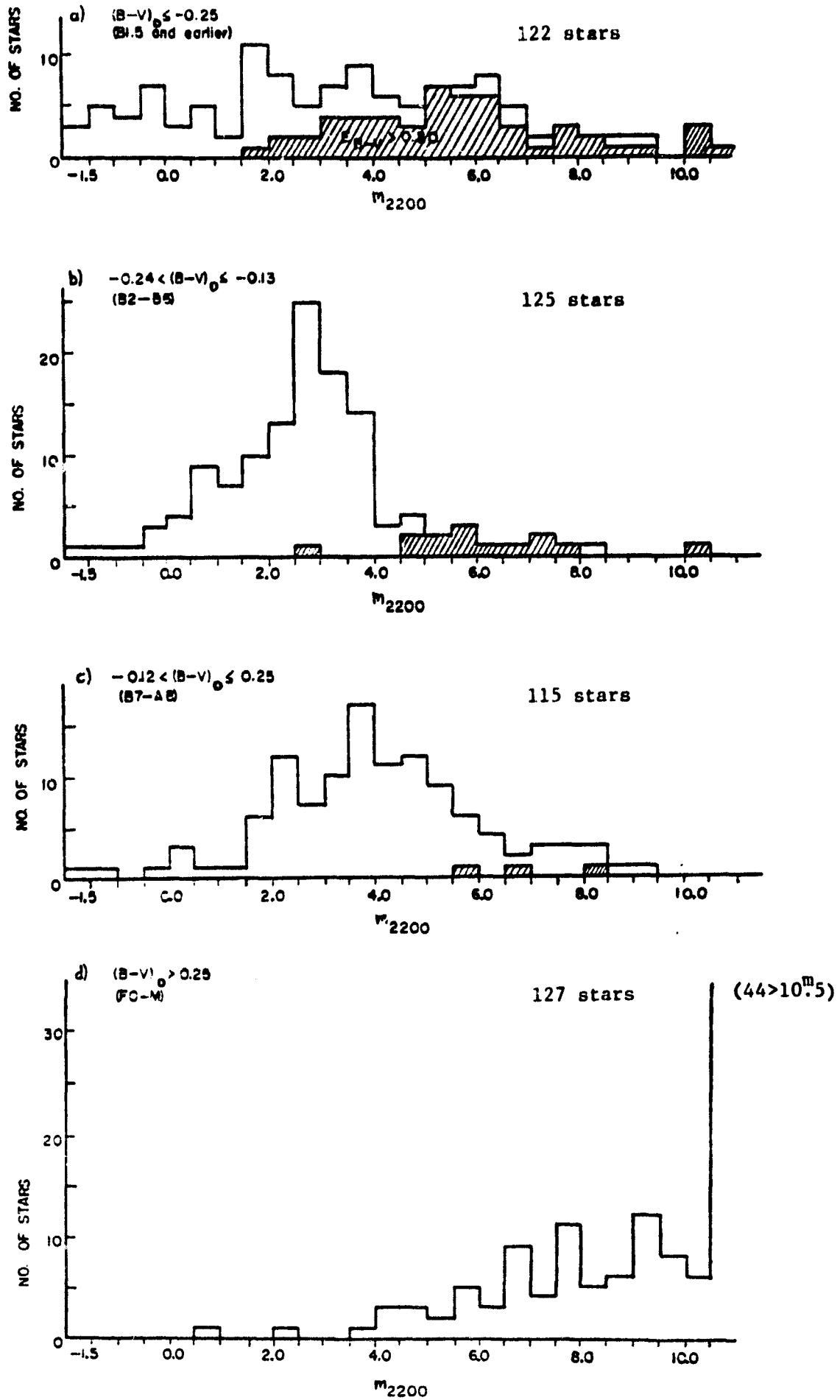
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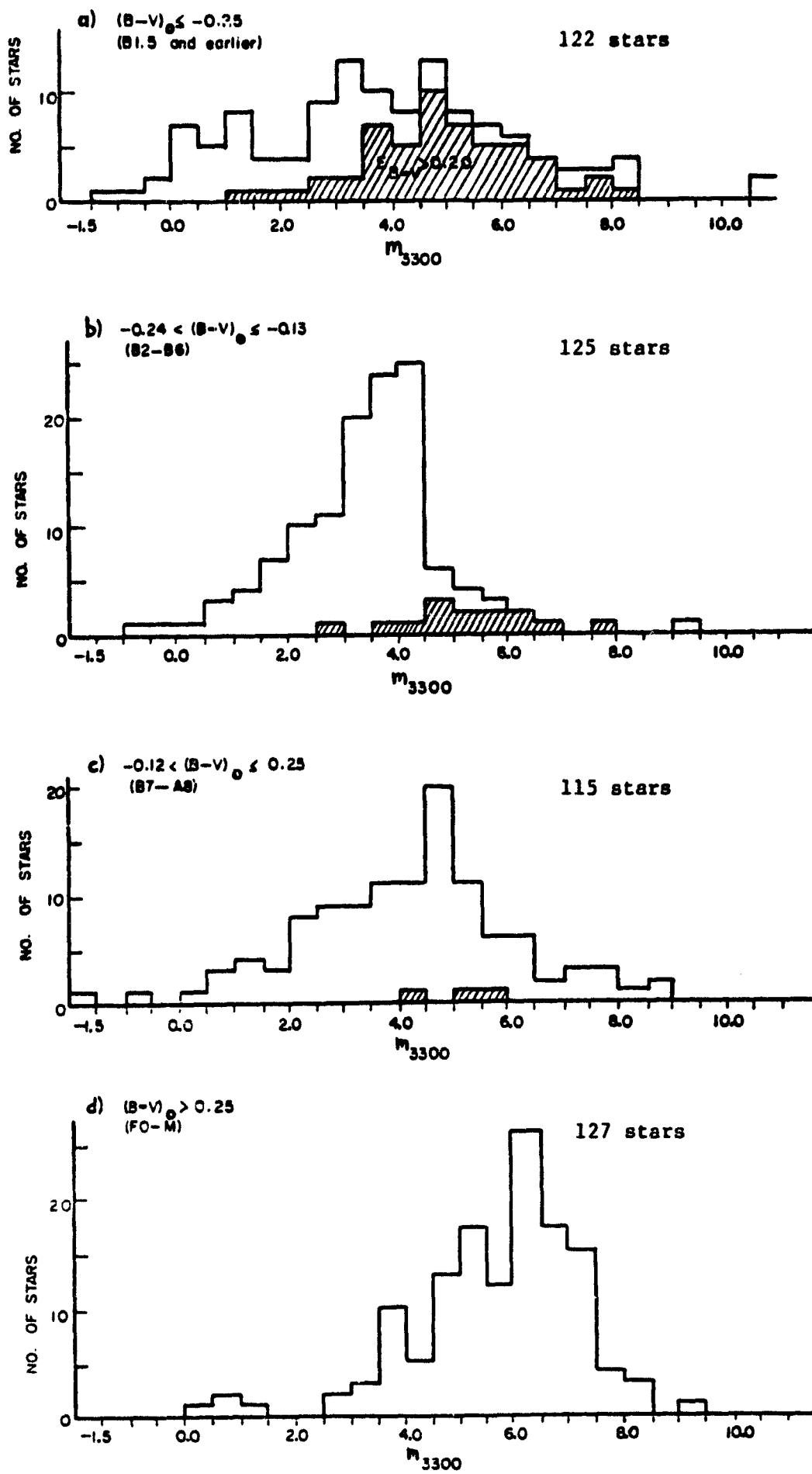
FIGURE CAPTIONS

- Figure 1 Frequency distribution of the 1550 \AA magnitude as a function of intrinsic color. 1a shows the number of stars with a given 1550 \AA magnitude for stars with an intrinsic $(B-V) \leq -0.25$ (spectral type B1.5 or earlier), 1b the number of stars with an intrinsic $(B-V)$ between -0.24 and -0.13 (spectral type B2 through B6), and 1c the number of stars with an intrinsic $(B-V)$ between -0.12 and 0.25 (spectral type B7 through A8). Shaded areas indicate the number of stars which have a color excess $E_{B-V} > 0.20$.
- Figure 2 Frequency distribution of the 2200 \AA magnitude as a function of intrinsic color. 2a shows the number of stars with a given 2200 \AA magnitude for stars with an intrinsic $(B-V) \leq -0.25$ (spectral type B1.5 or earlier), 2b the number of stars with an intrinsic $(B-V)$ between -0.24 and -0.13 (spectral type B2 through B6), 2c the number of stars with an intrinsic $(B-V)$ between -0.12 and 0.25 (spectral type B7 through A8), and 2d the number of stars with an intrinsic $(B-V) > 0.25$ (spectral type F0 through M). Shaded areas indicate the number of stars which have a color excess $E_{B-V} > 0.20$.
- Figure 3 Frequency distribution of the 3300 \AA magnitude as a function of intrinsic color. 3a shows the number of stars with a given 3300 \AA magnitude for stars with an intrinsic $(B-V) \leq -0.25$ (spectral type B1.5 or earlier), 3b the number of stars with an intrinsic $(B-V)$ between -0.24 and -0.13 (B2 through B6), 3c the number of stars with an intrinsic $(B-V)$ between -0.12 and 0.25 (B7 through A8), and 3d the number of stars with an intrinsic $(B-V) > 0.25$ (F0 through M). Shaded areas indicate the number of stars which have $E_{B-V} > 0.20$.

1550

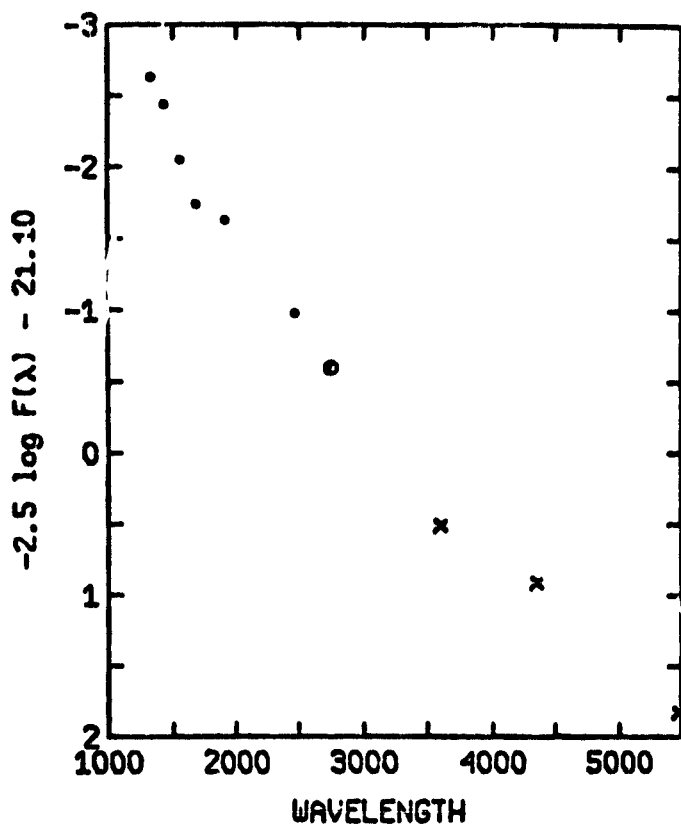




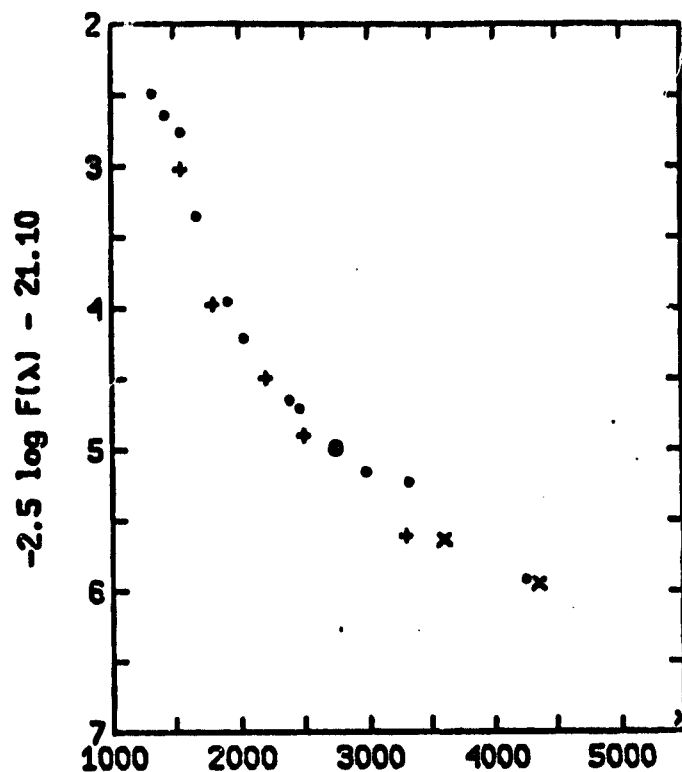


THE
OAO-2, ANS, TD1, UBV
PICTURE
GALLERY

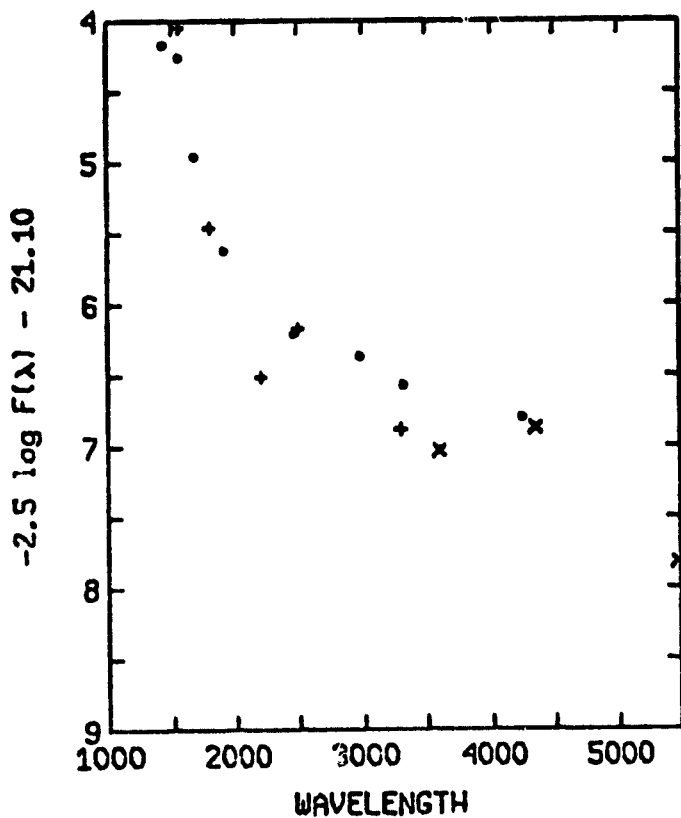
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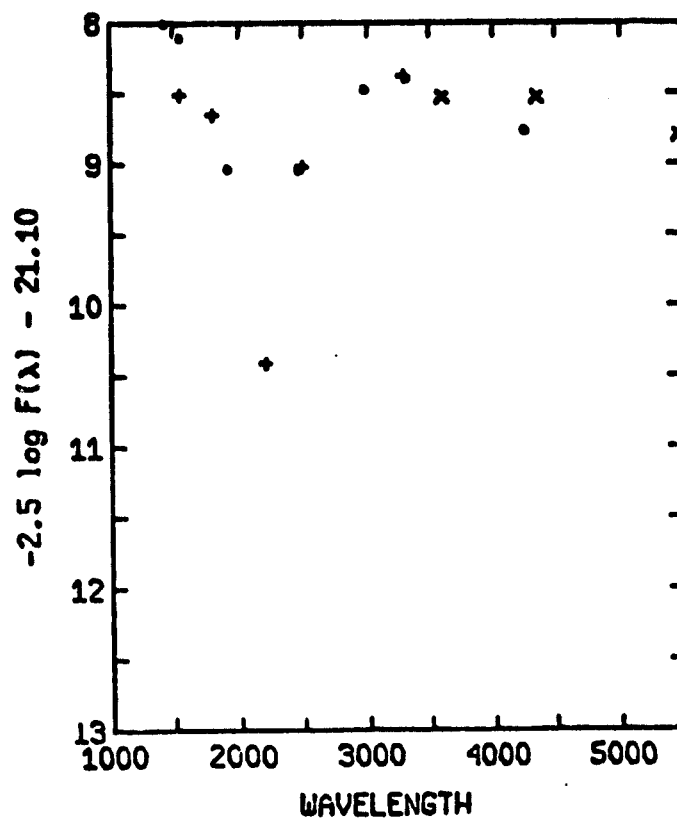
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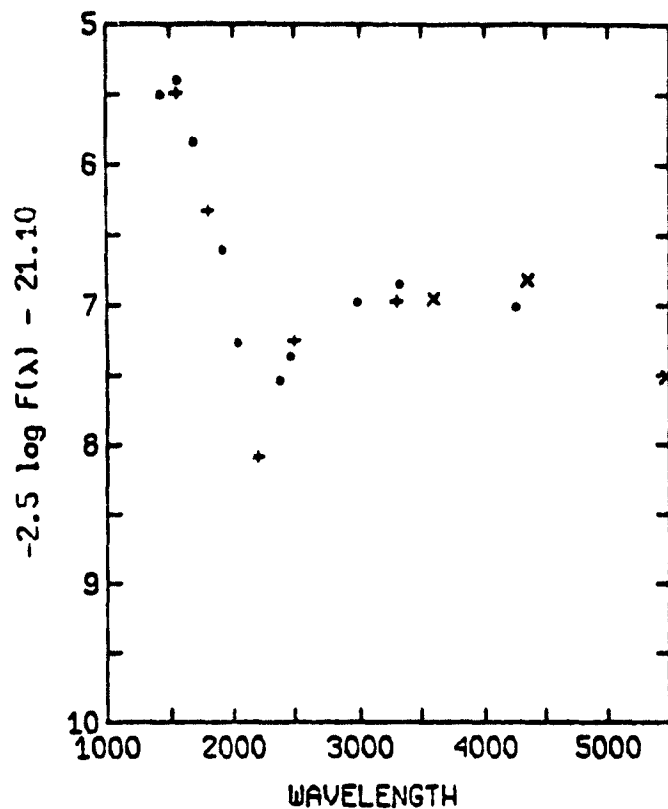
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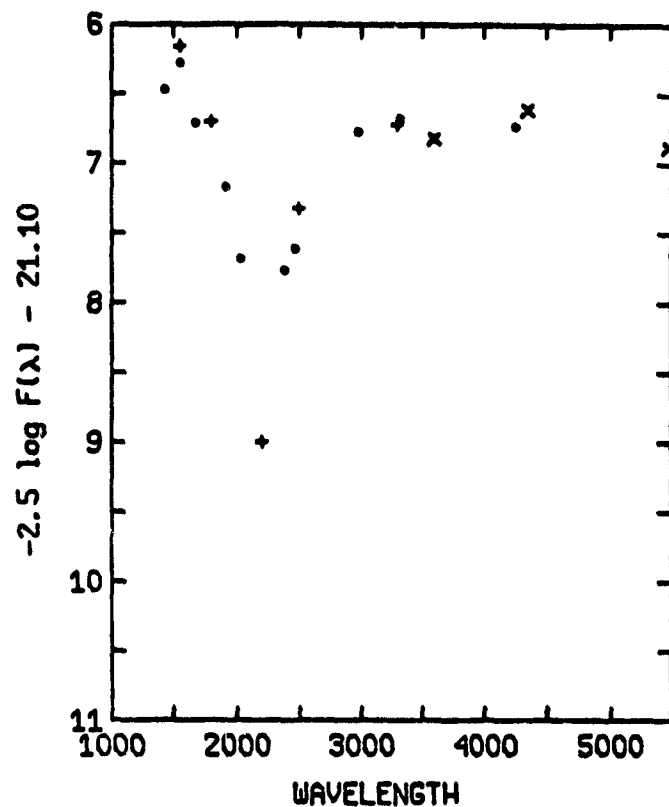
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HD 192163 WN6

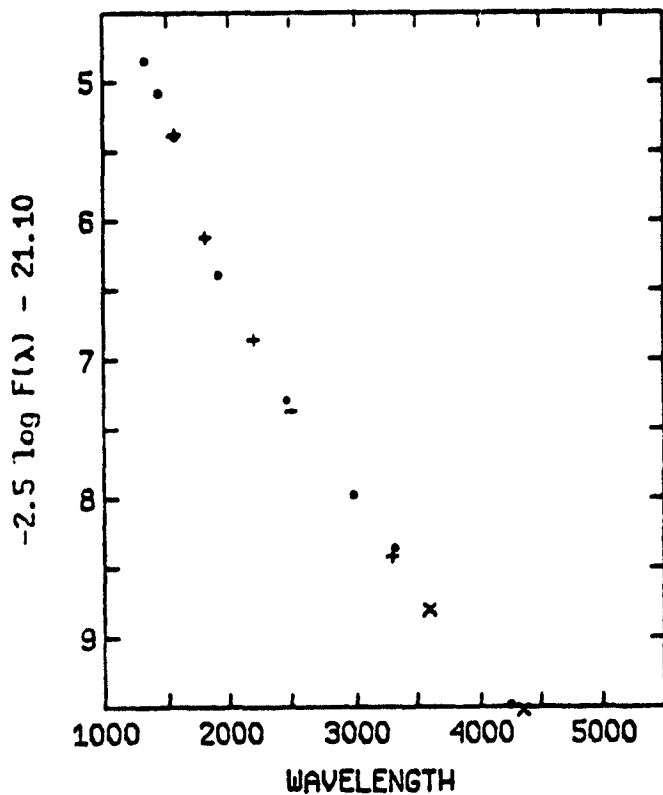


HD 193793 WC6+O6

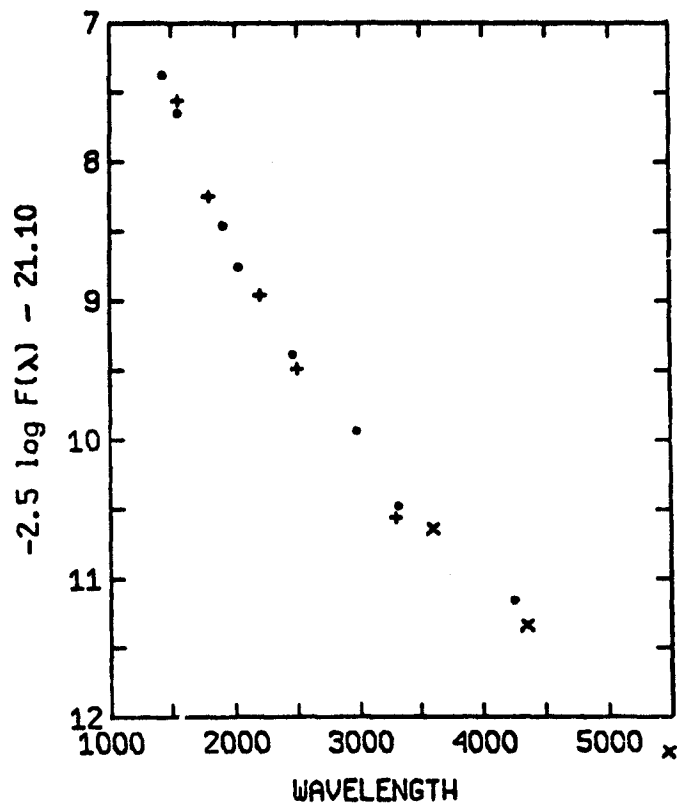


Subdwarfs
B1-B2

+28° 4211 O P



FEIGE 24 DA E

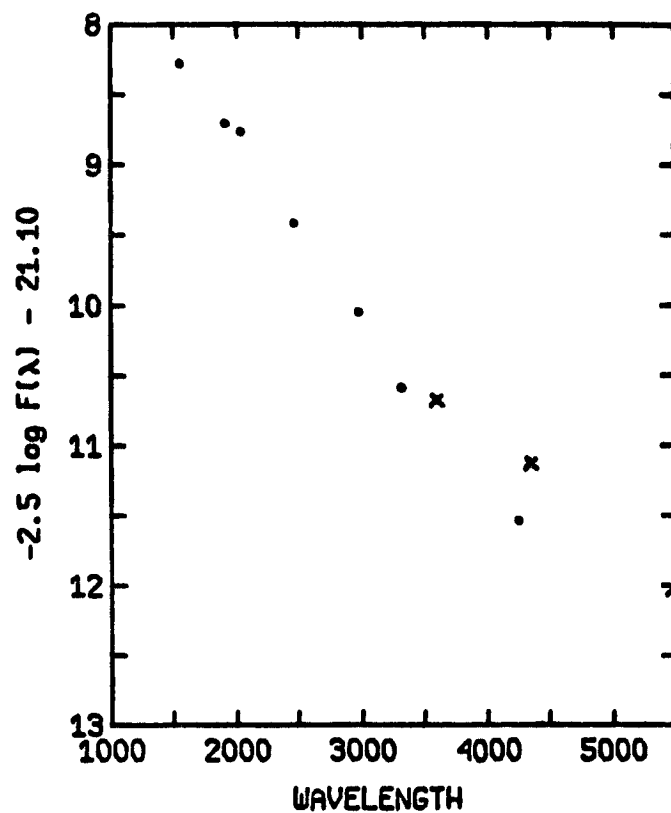
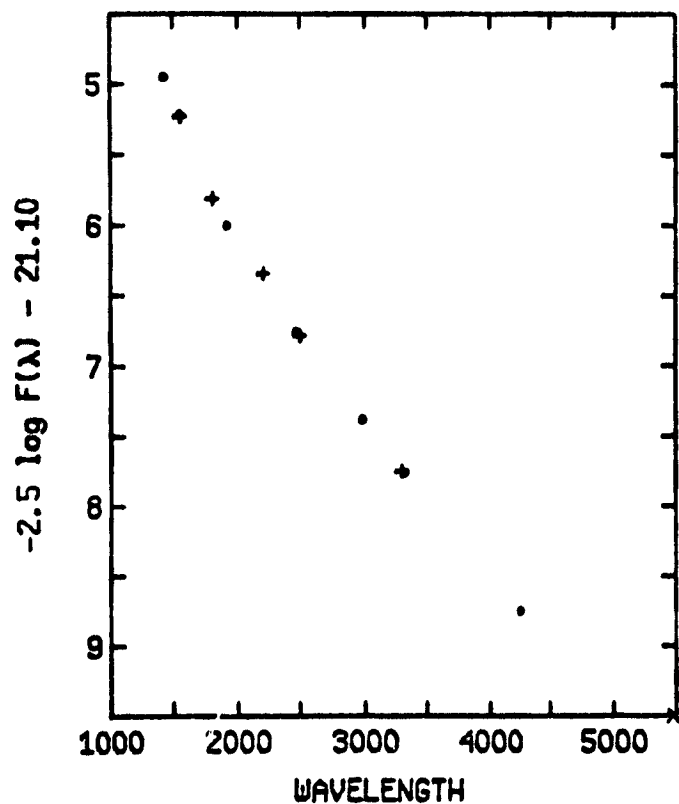


Subdwarfs
B3-B5

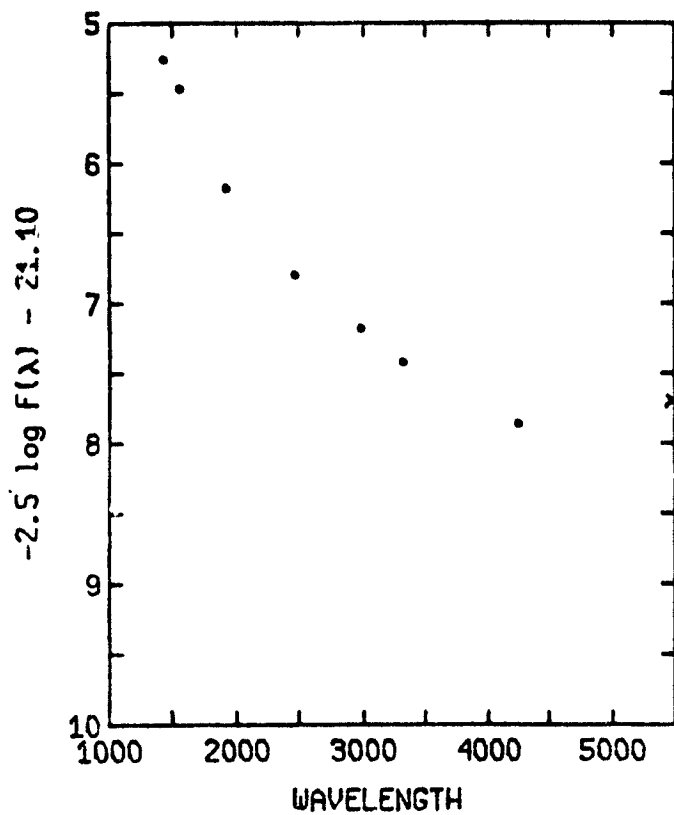
-33-

+25° 4655 SD06

FEIGE 65 SDB2

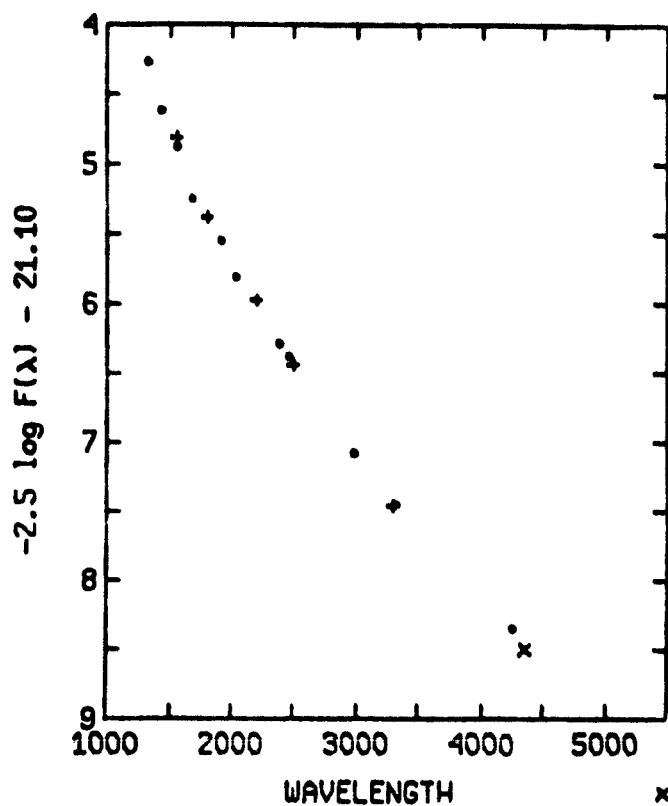


HD 205697 SS CYG SDBE+DG5

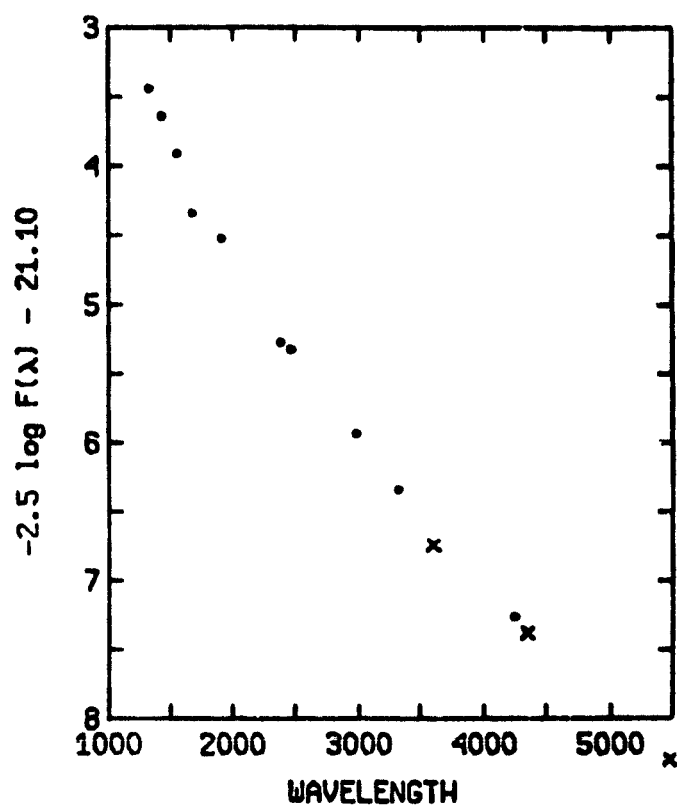


0 stars
C1-C4

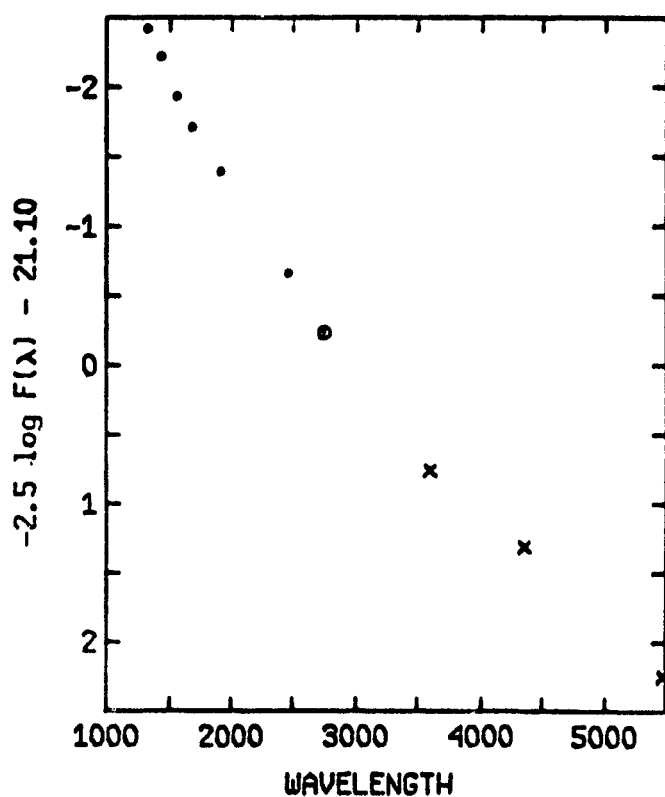
+75° 325 05 P



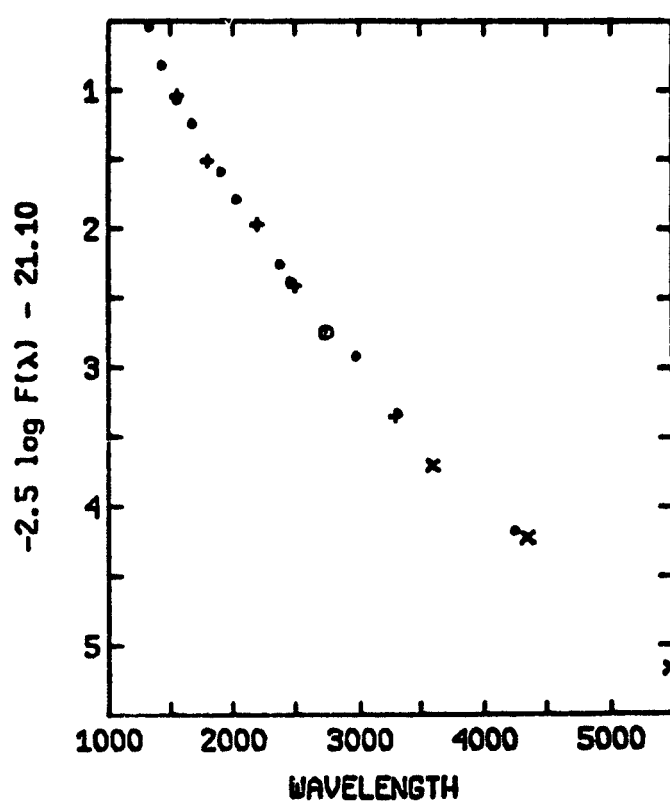
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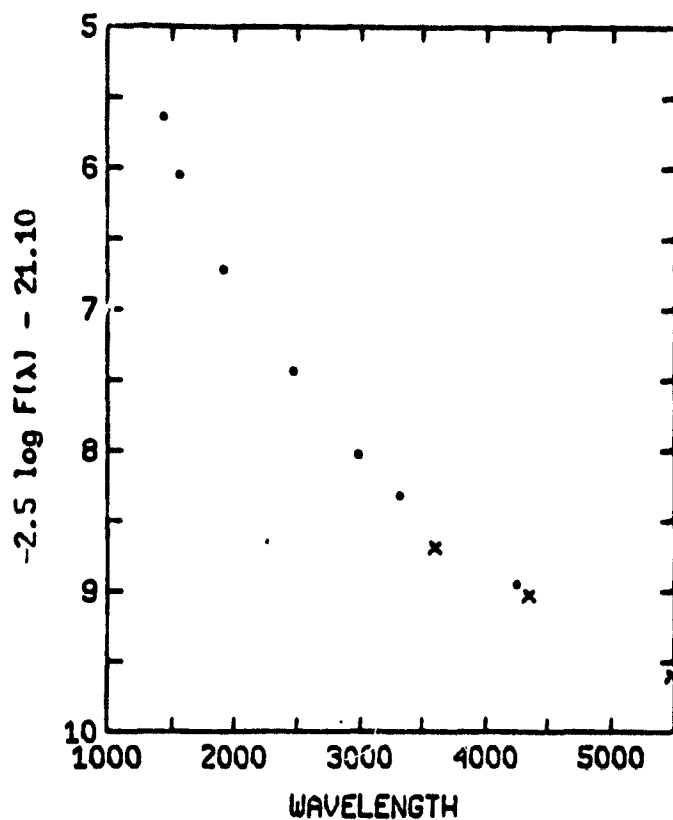
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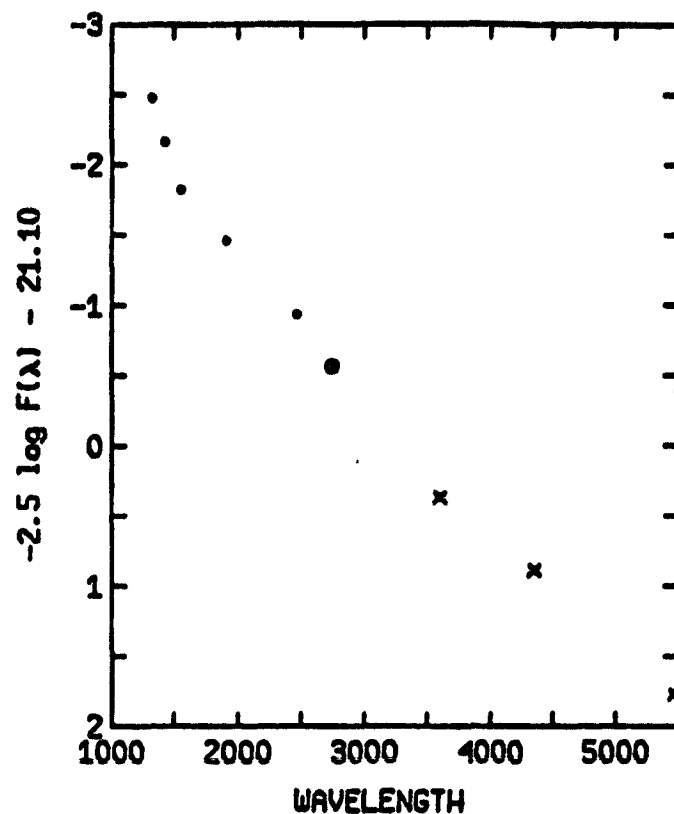
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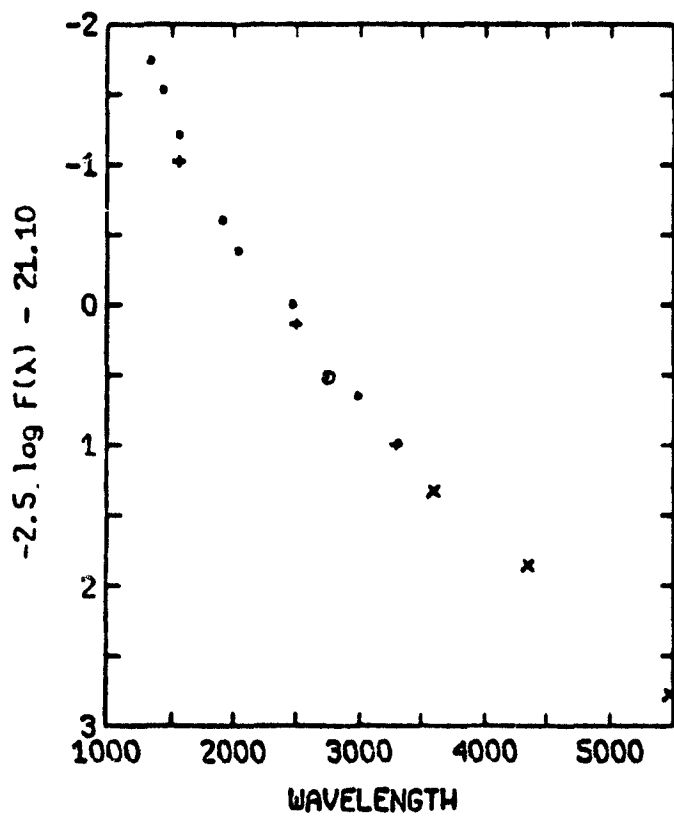
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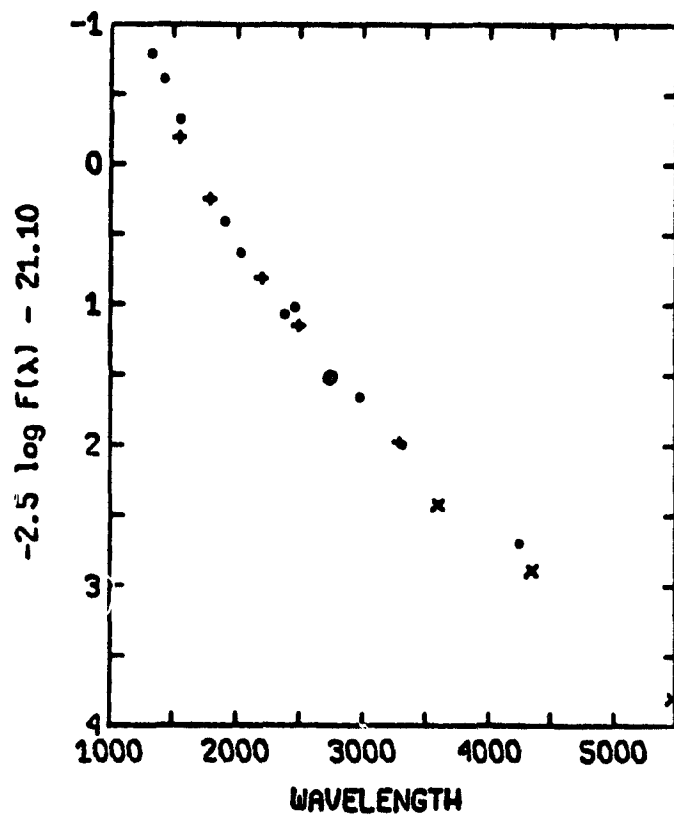
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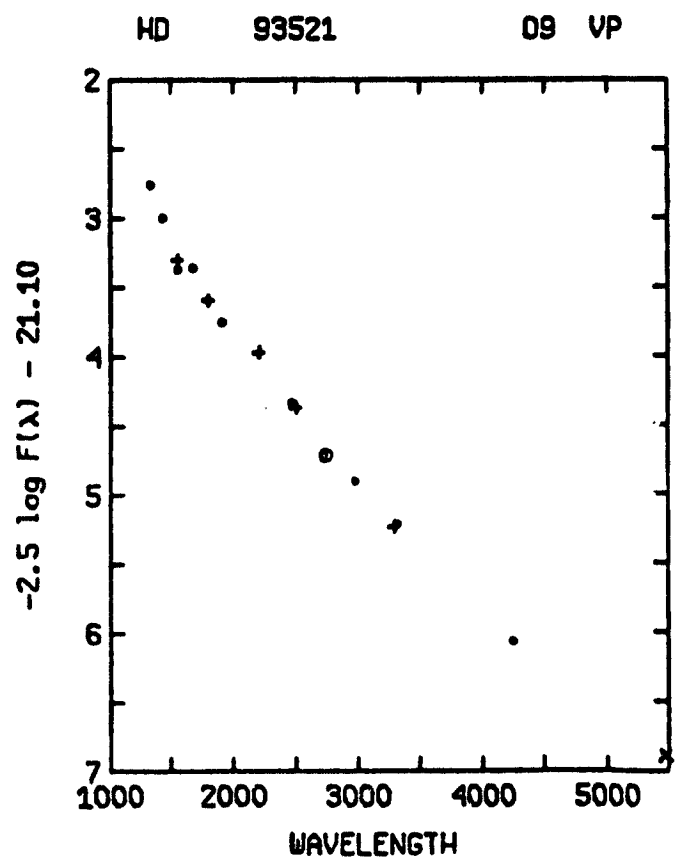
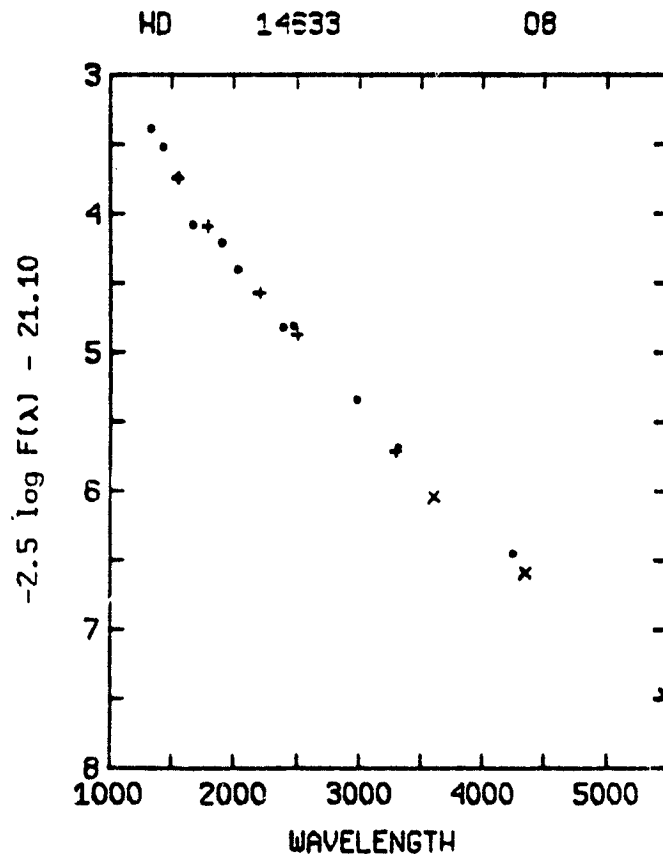
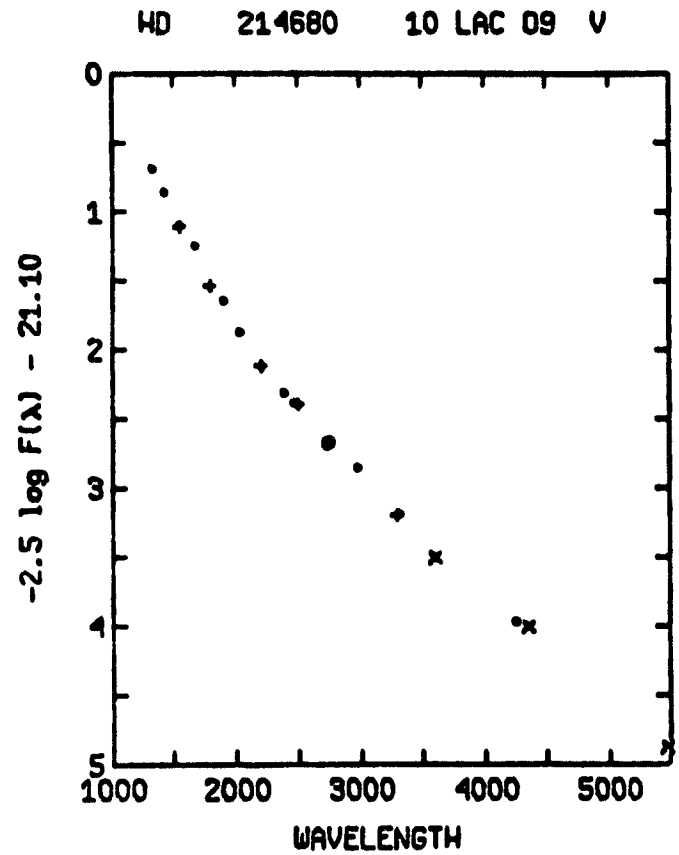
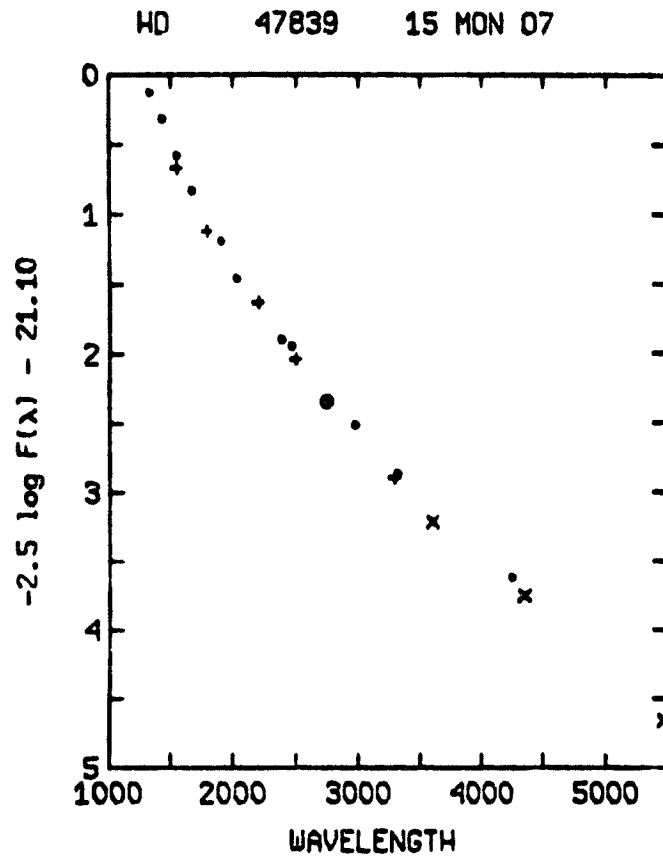


HD 37043 10T ORI 09 III



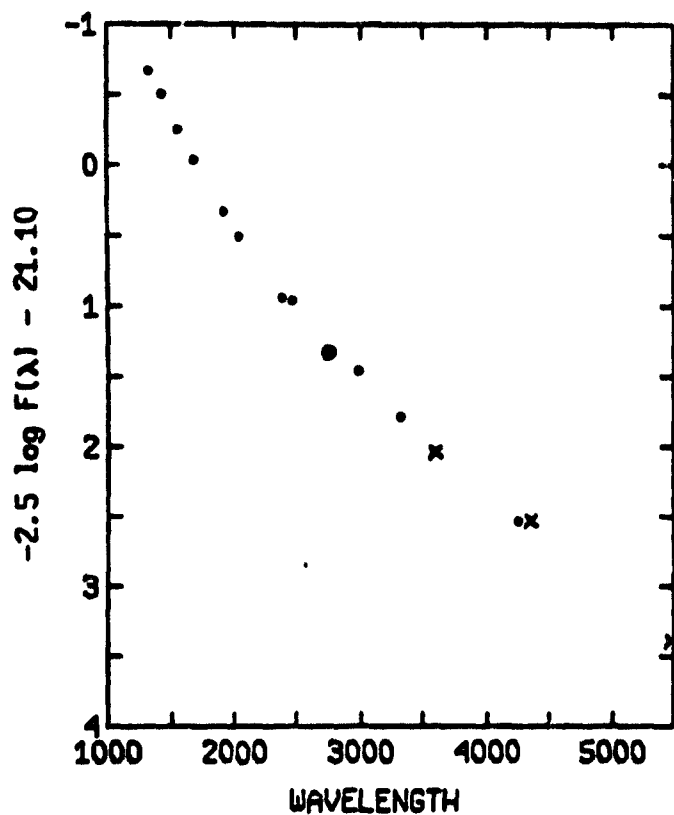
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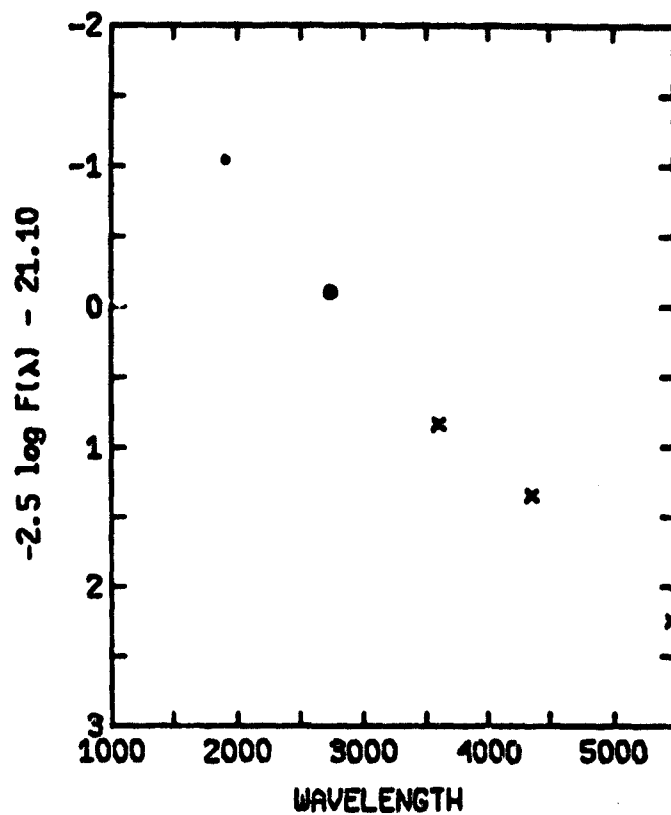


O stars
C13-C16

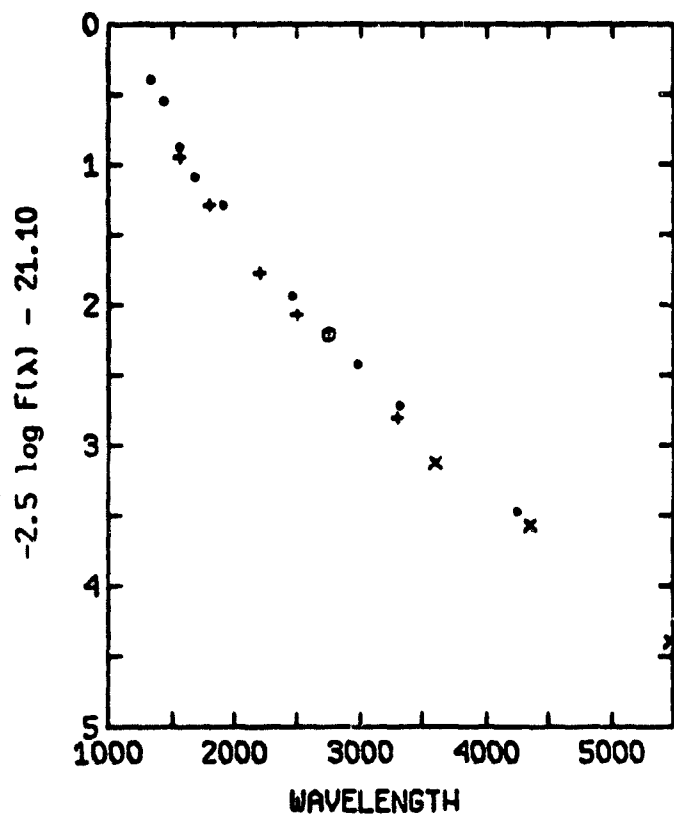
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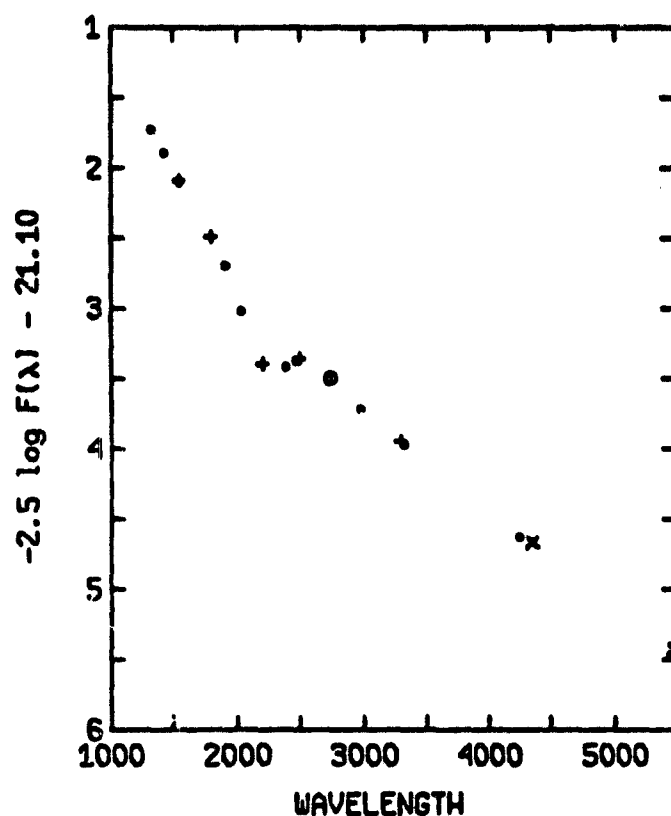
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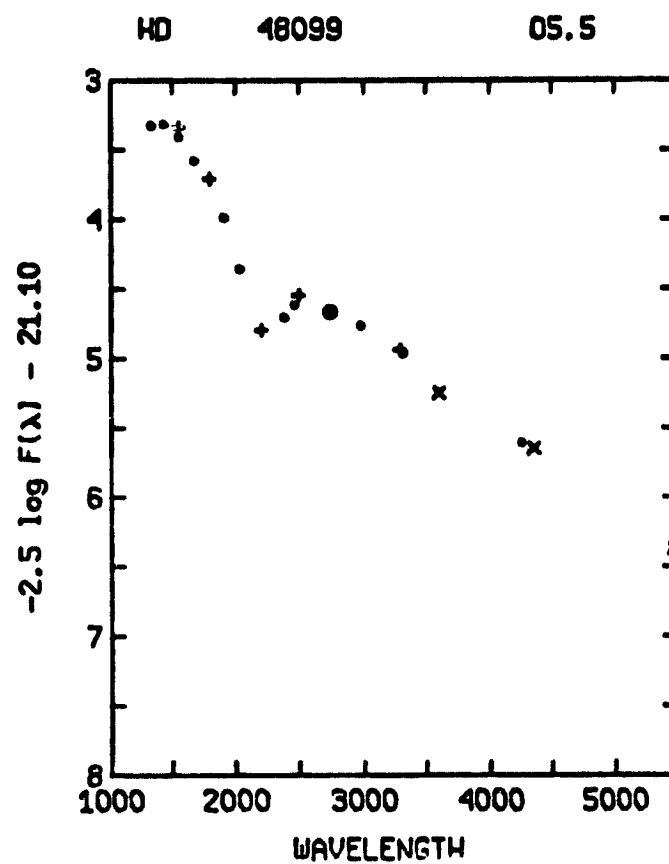
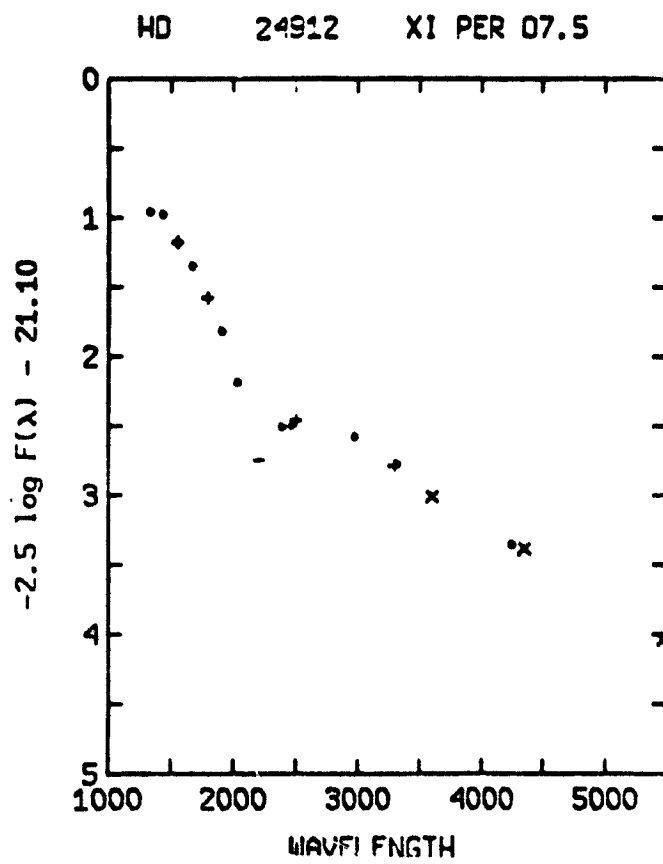
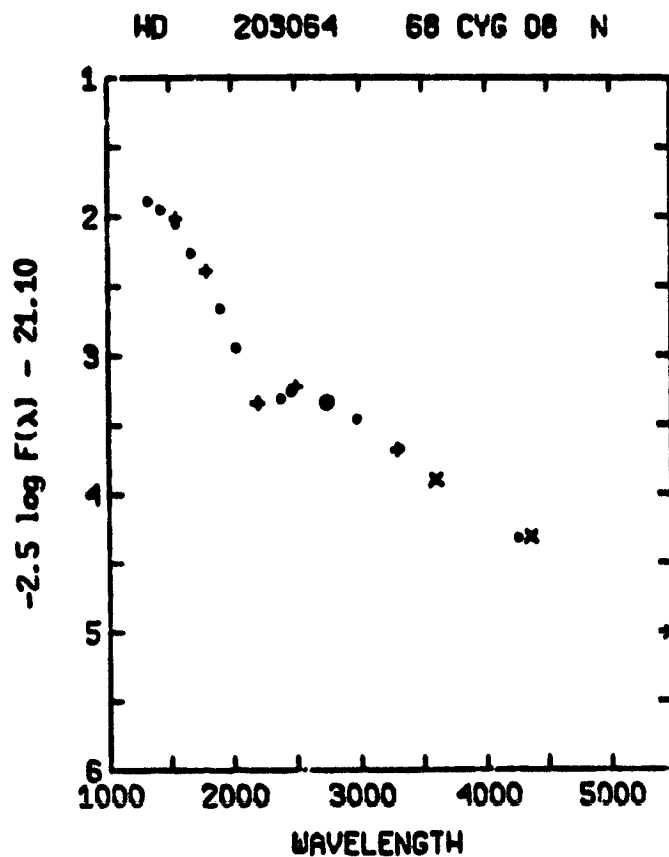
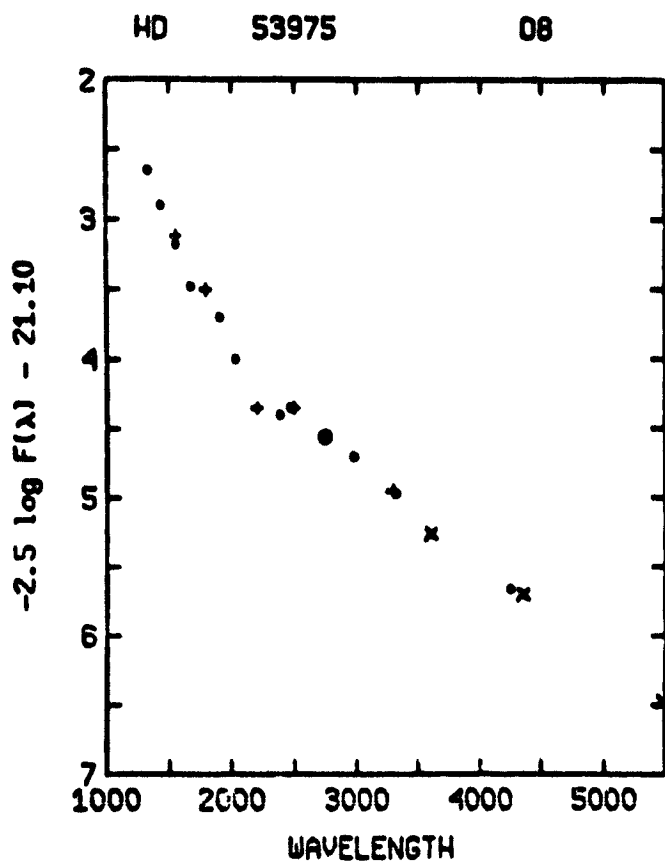
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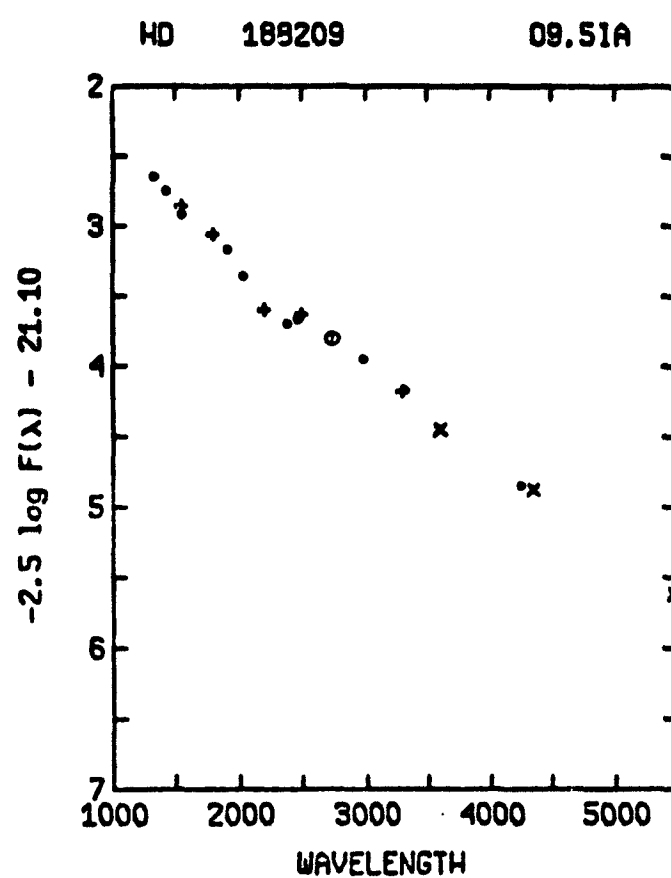
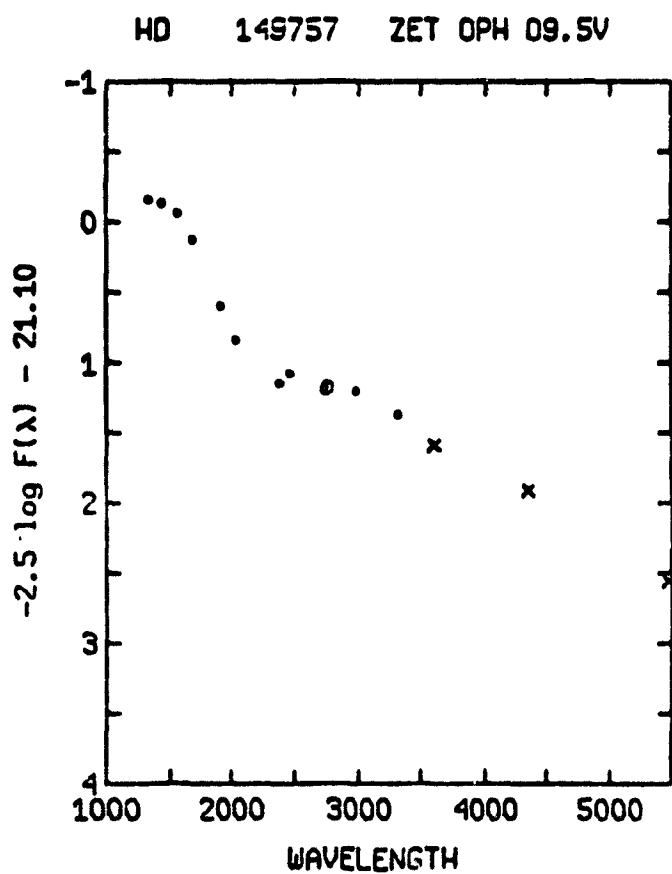
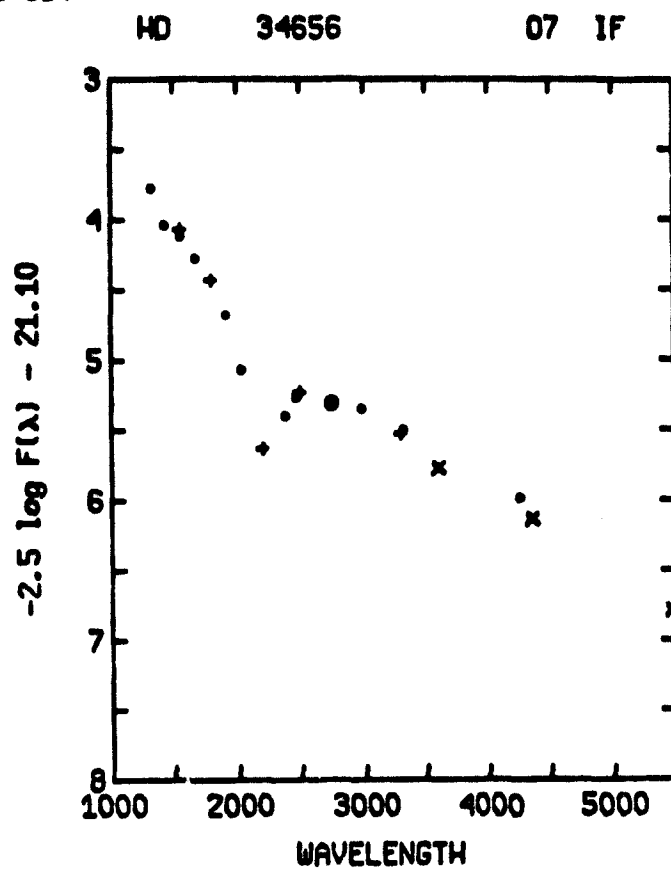
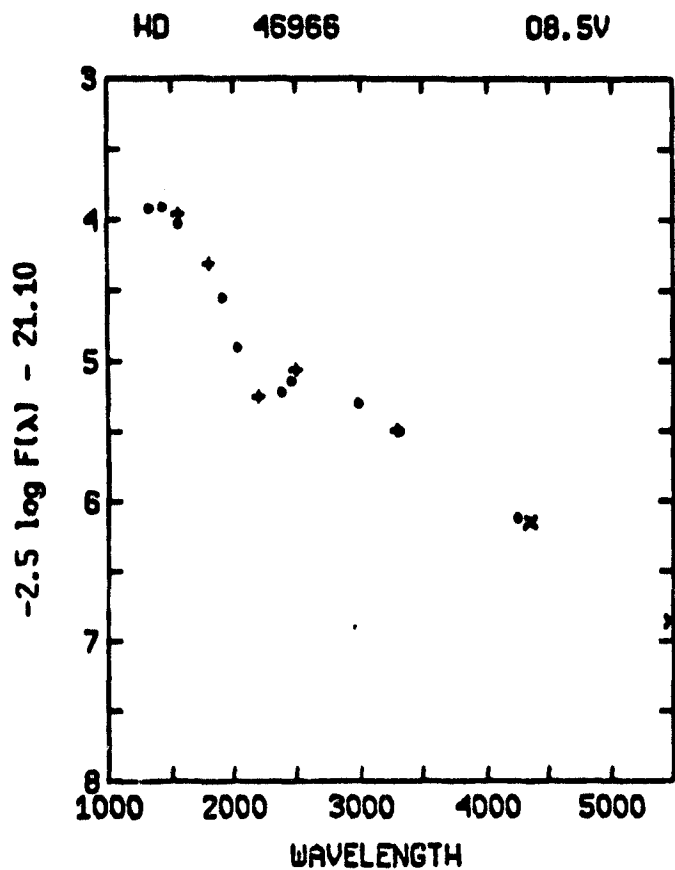
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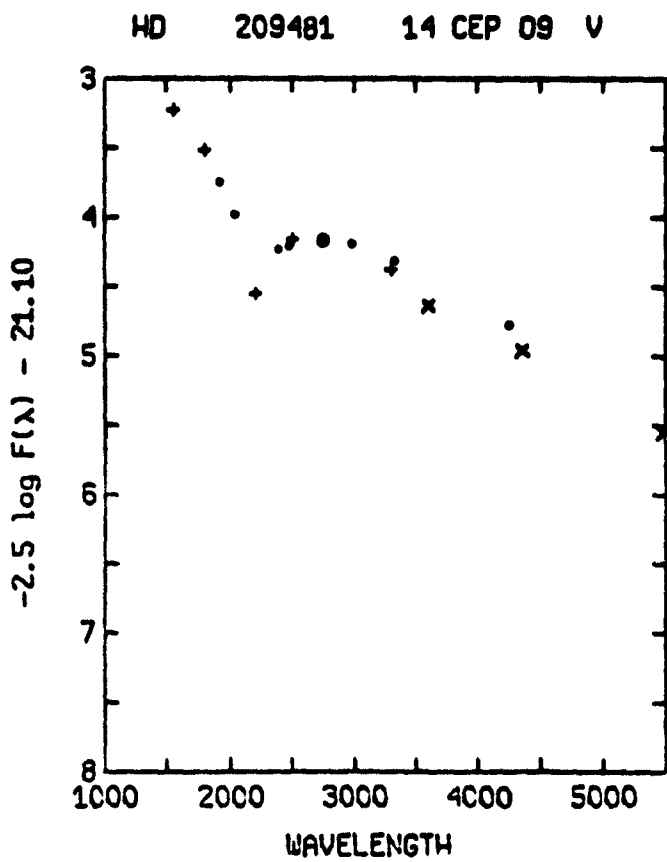
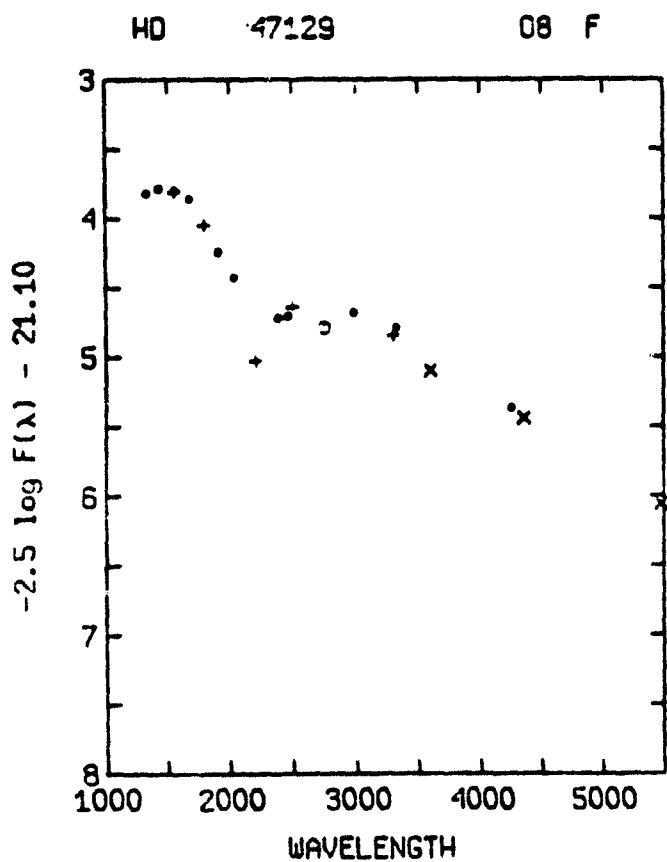
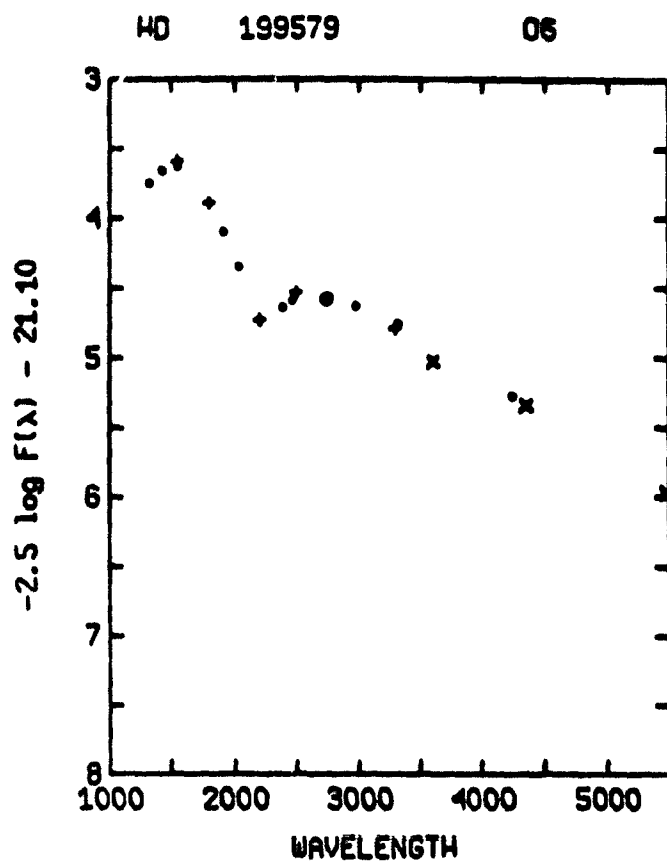
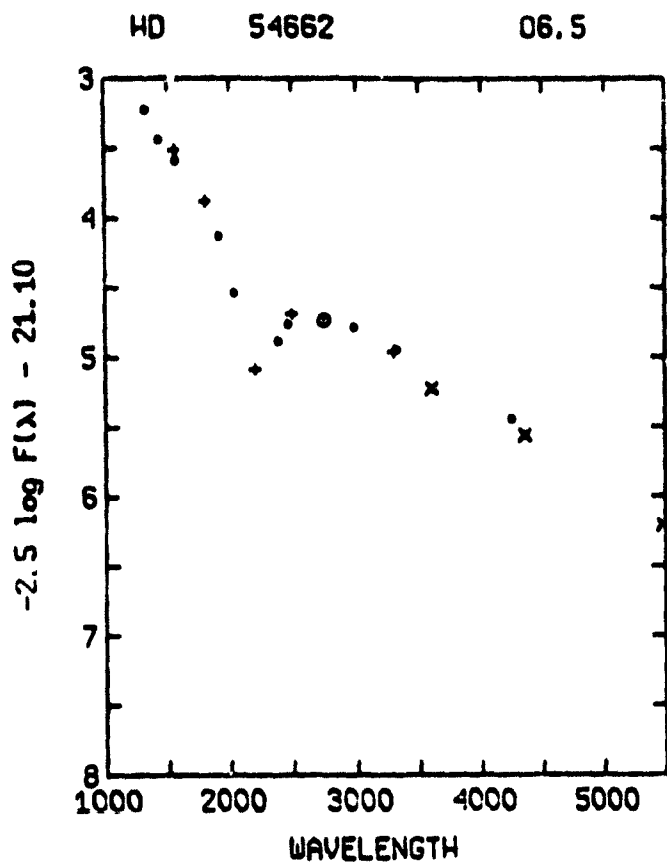


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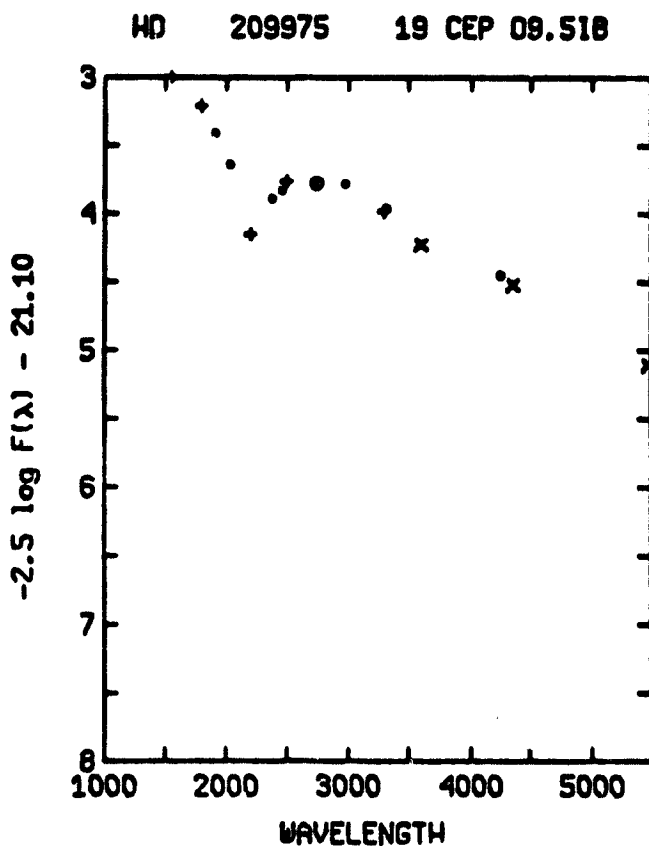
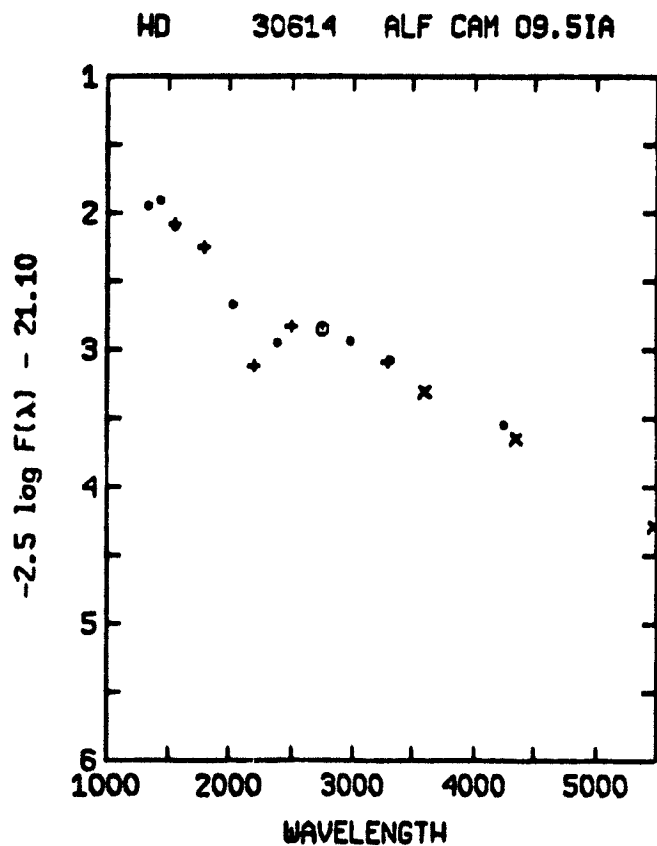
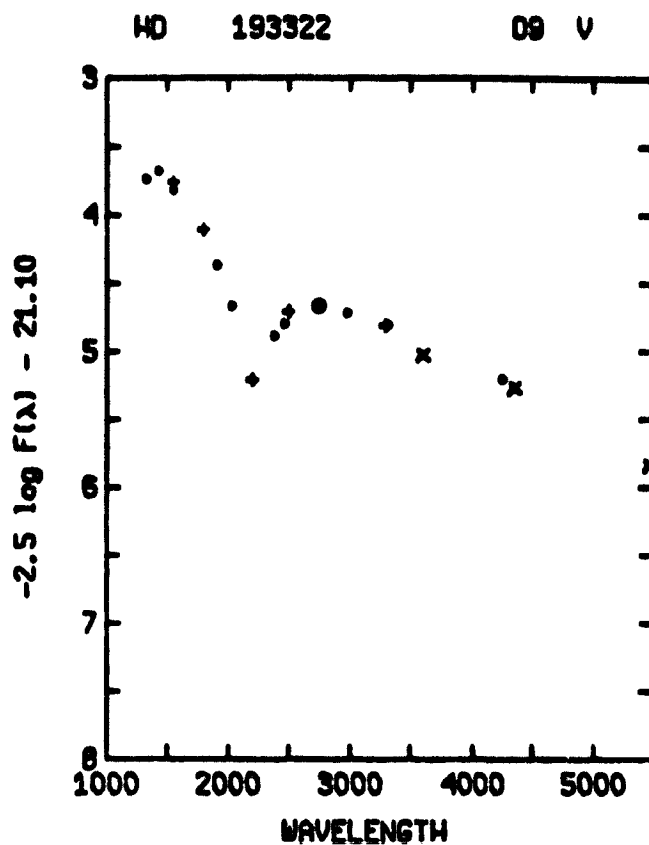
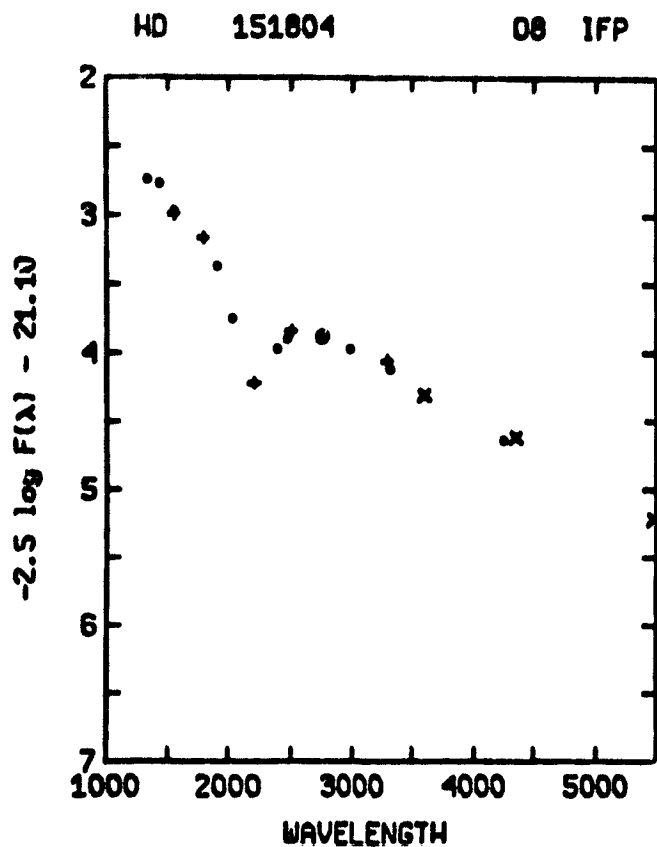


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C21-C24



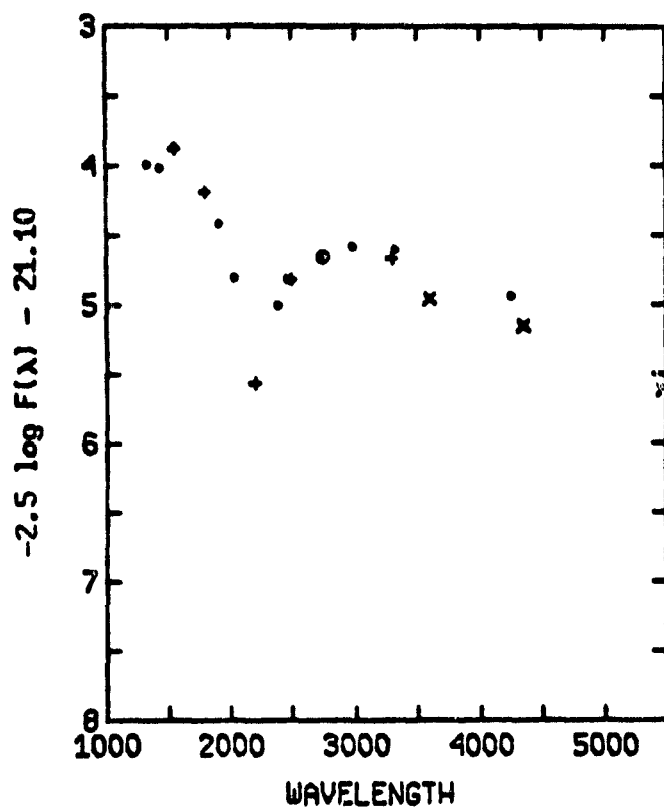


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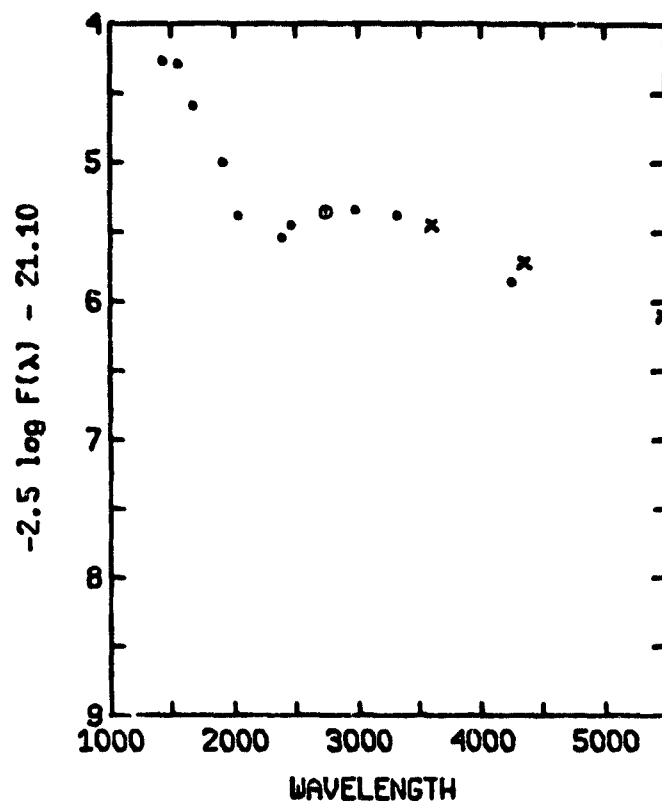


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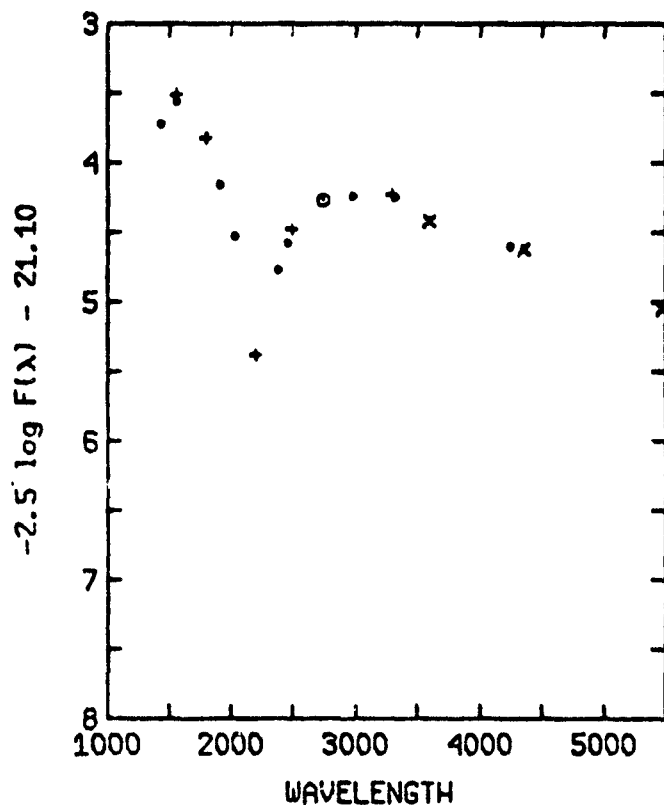
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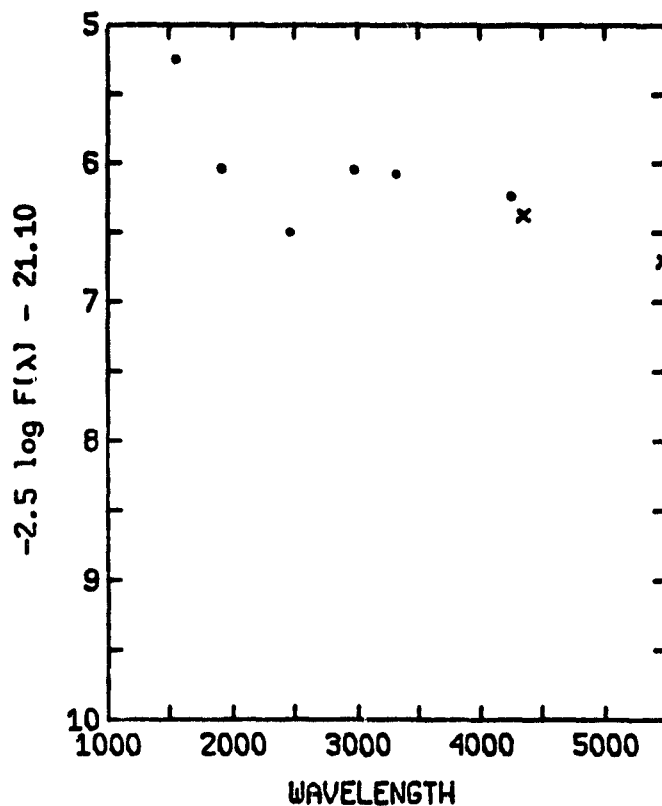
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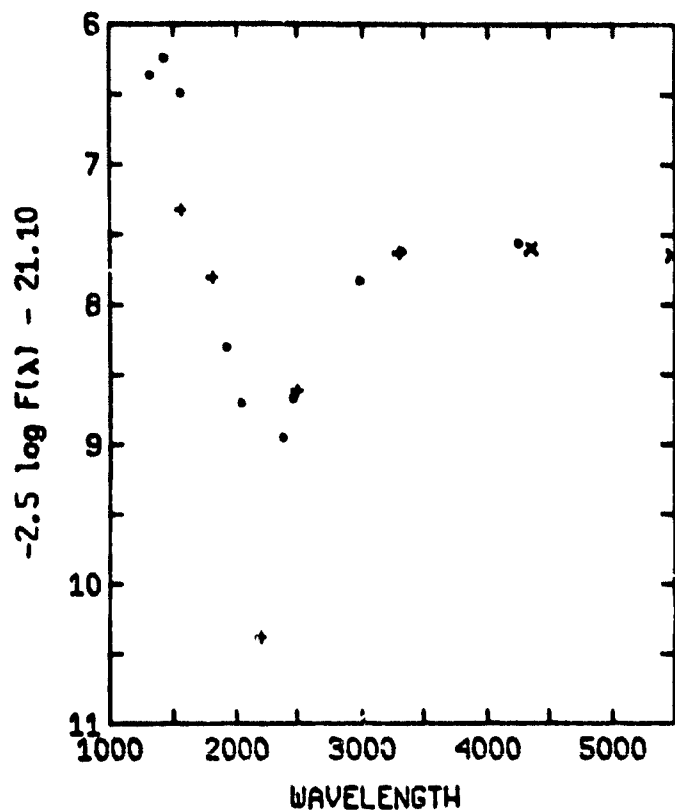


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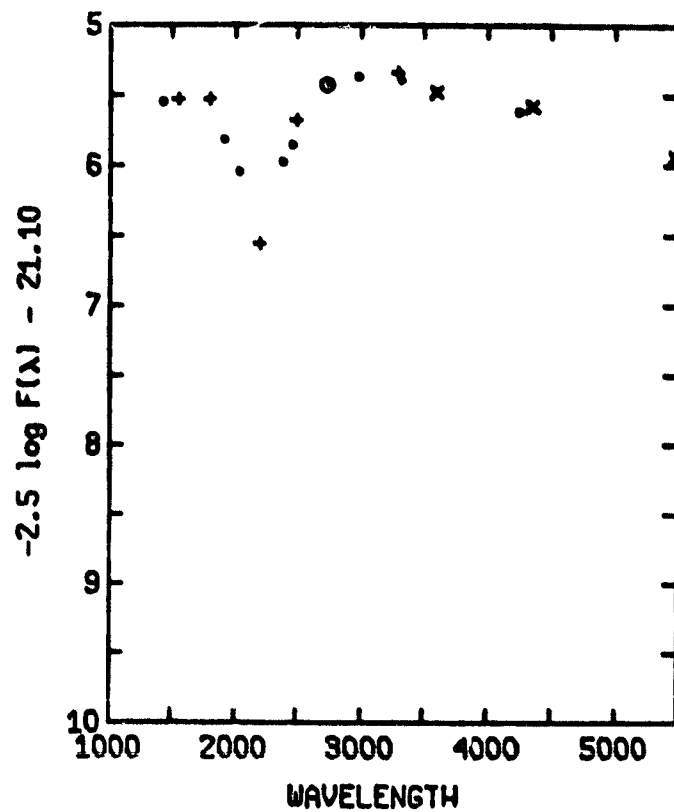


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C37-C39

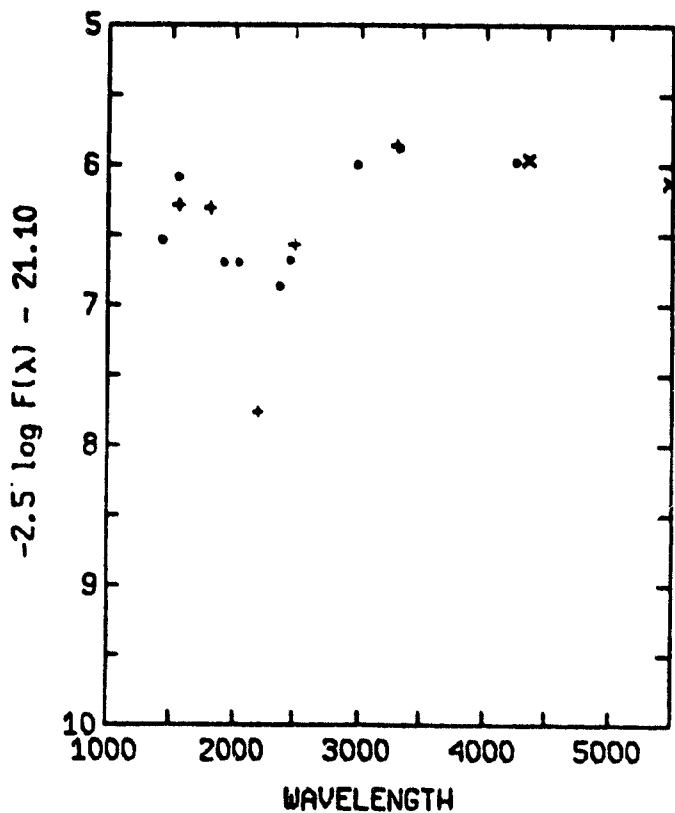
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HD 207198 09 11

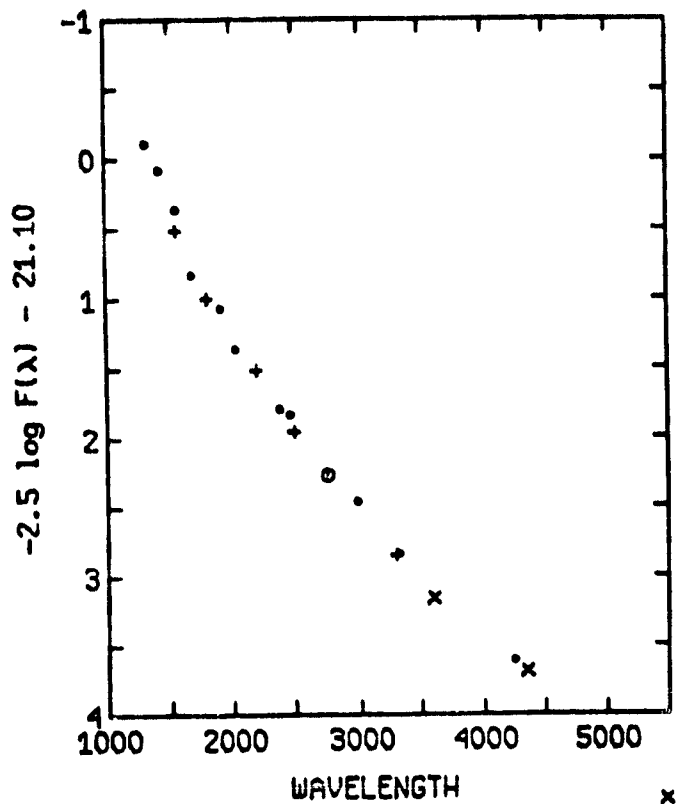


HD 154368 09.51A

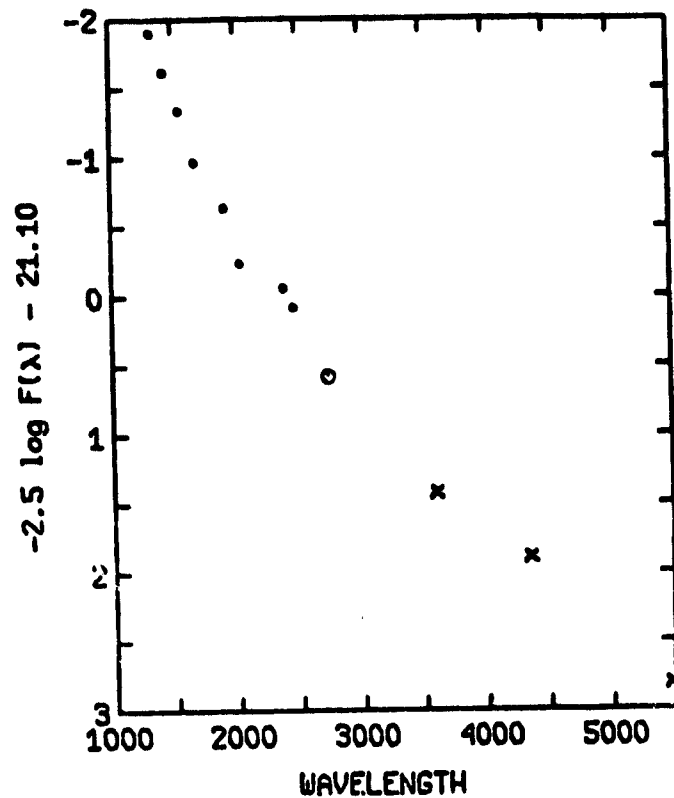


BO stars
D1-D4

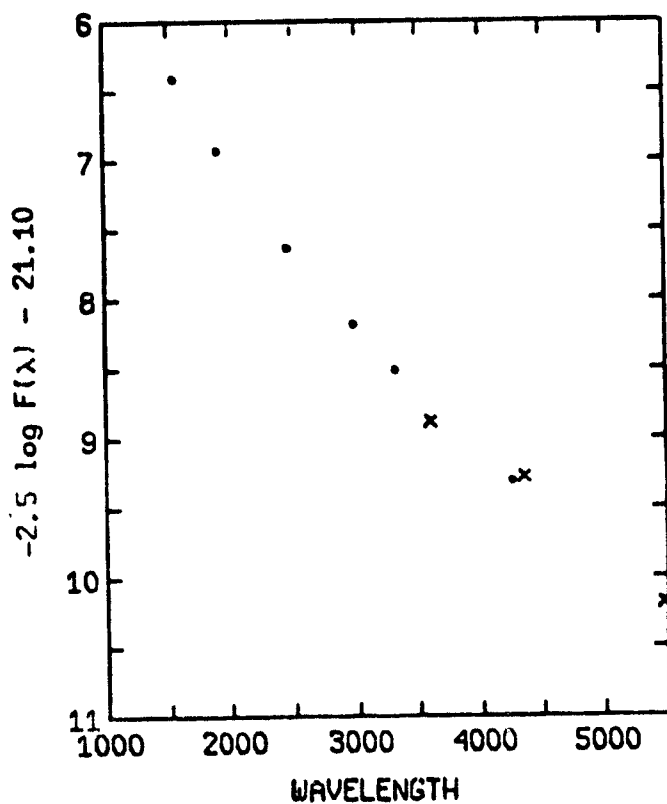
HD 36512 UPS ORI B0 V



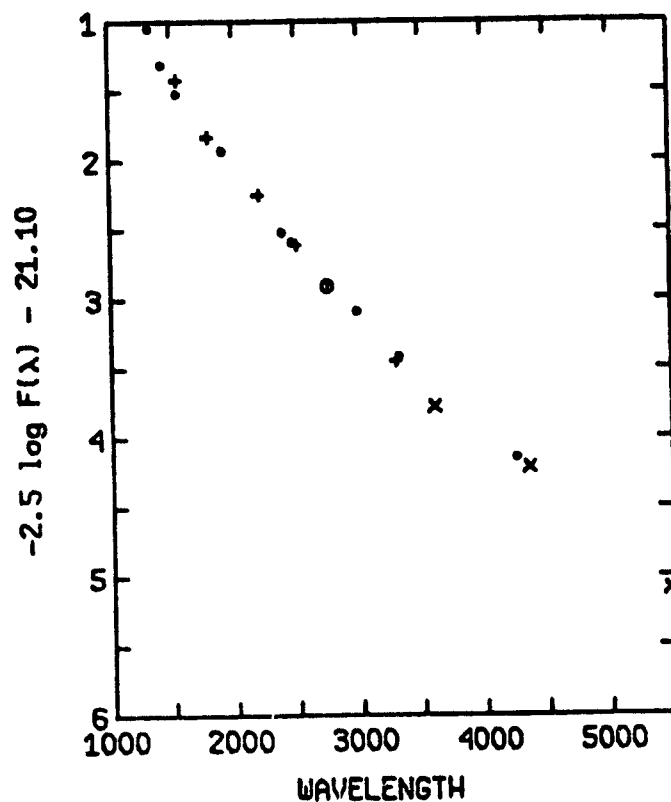
HD 149438 TAU SCO B0 V



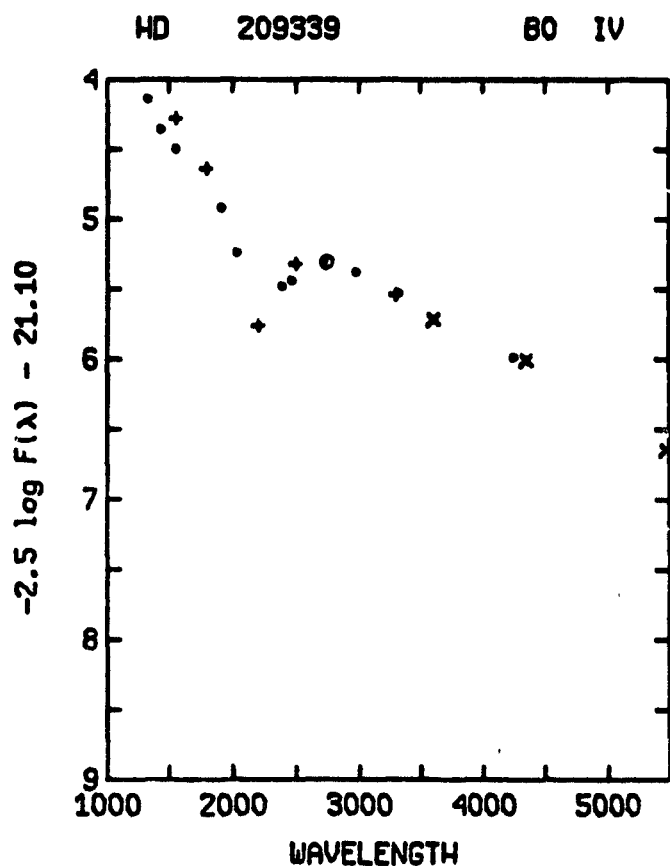
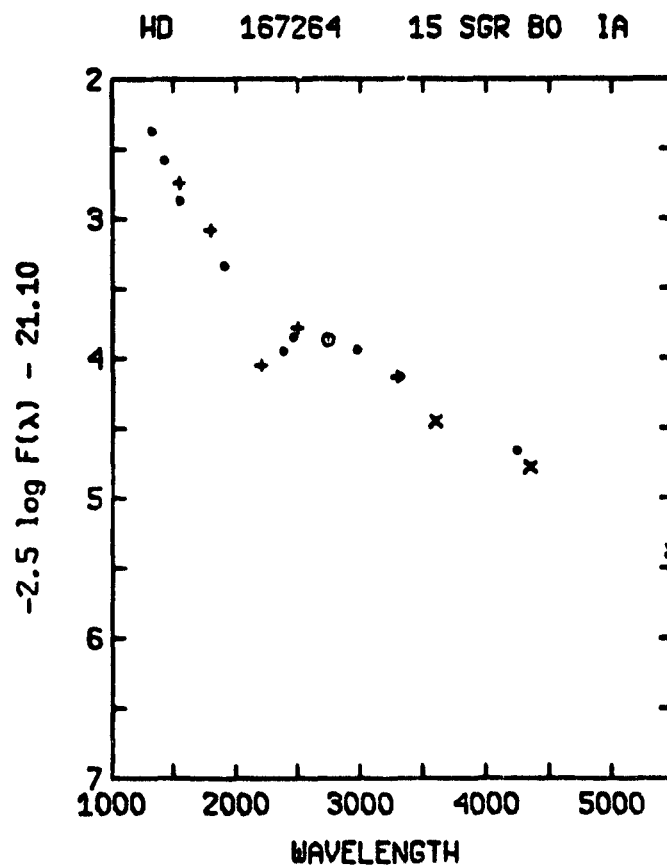
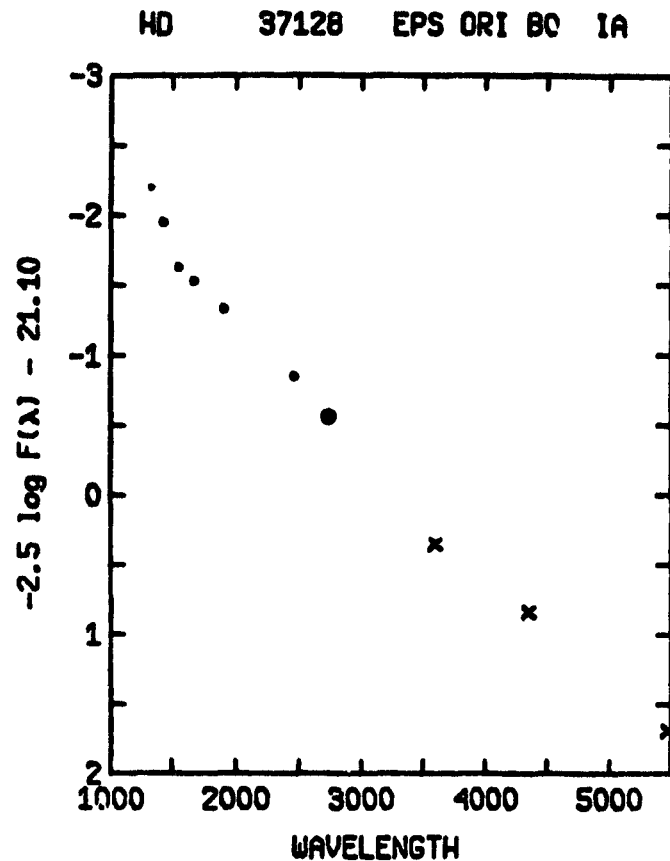
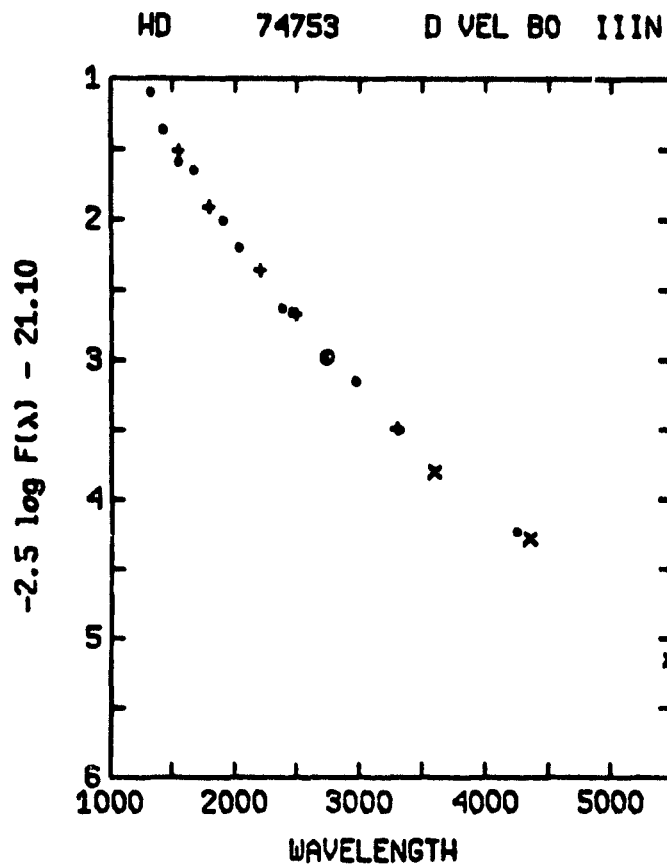
HD 100340 +6°2461 B0

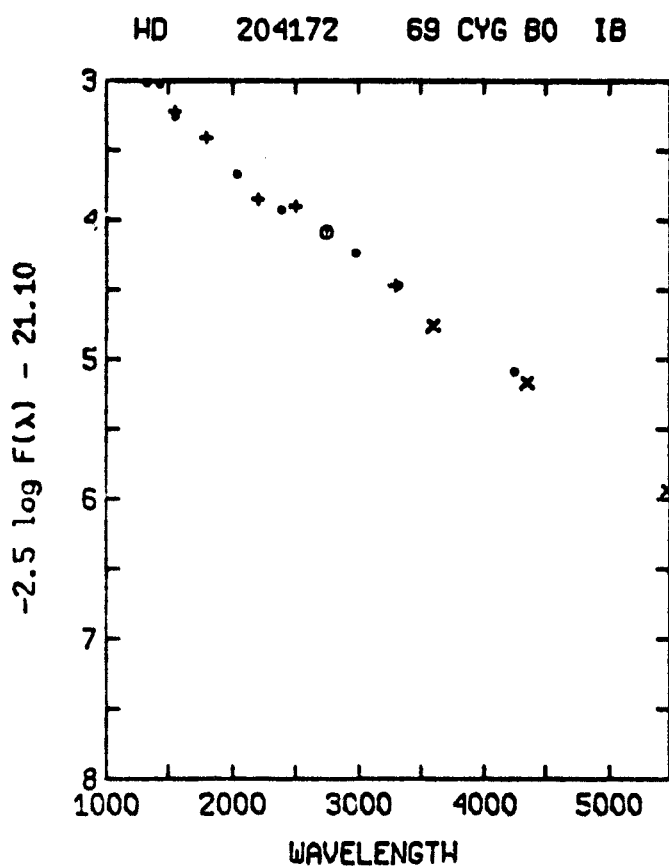
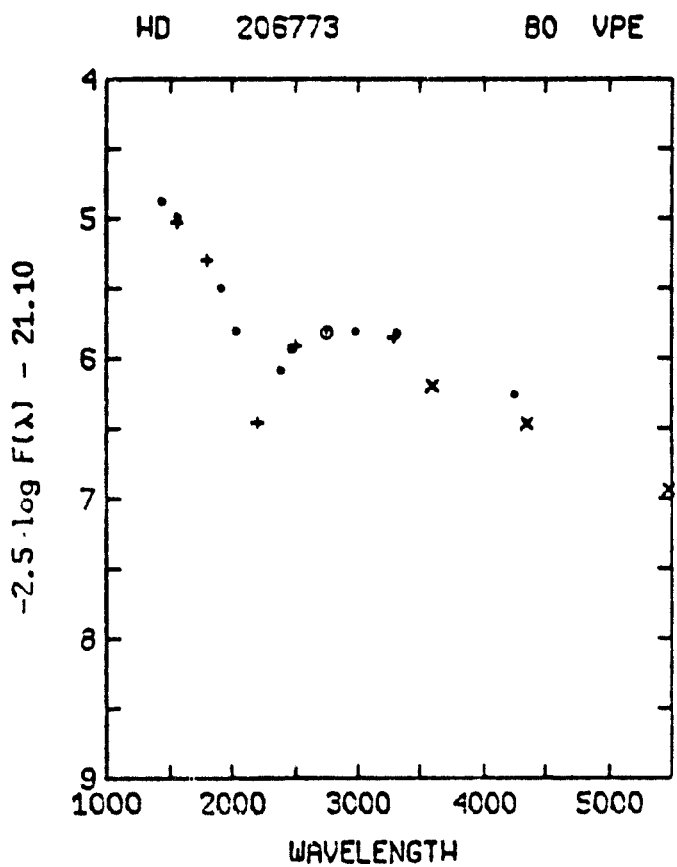
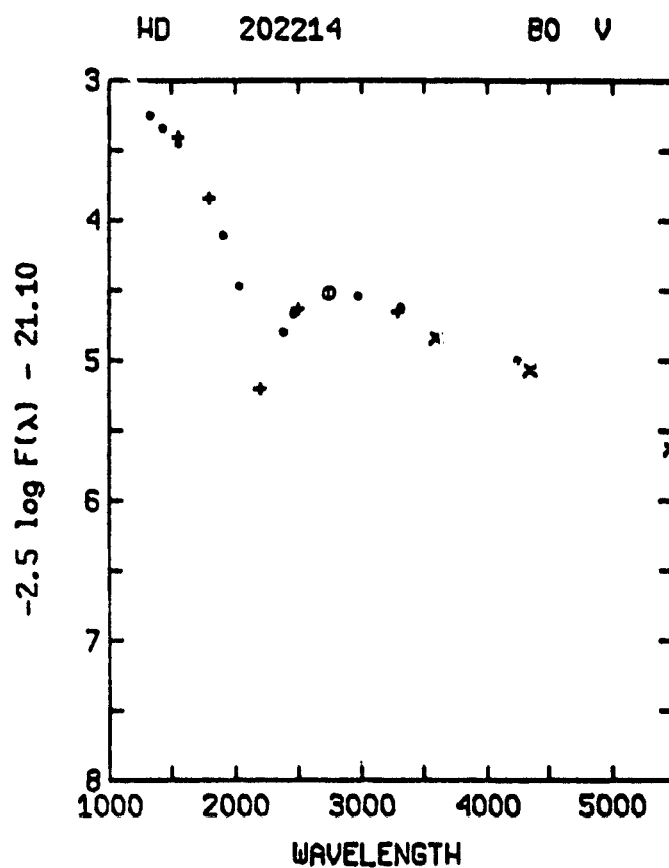
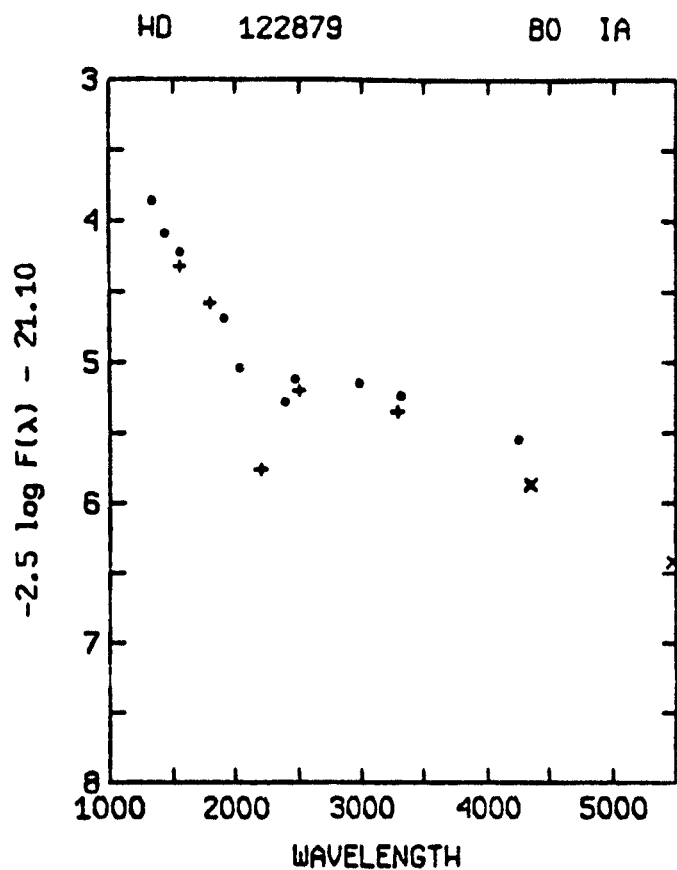


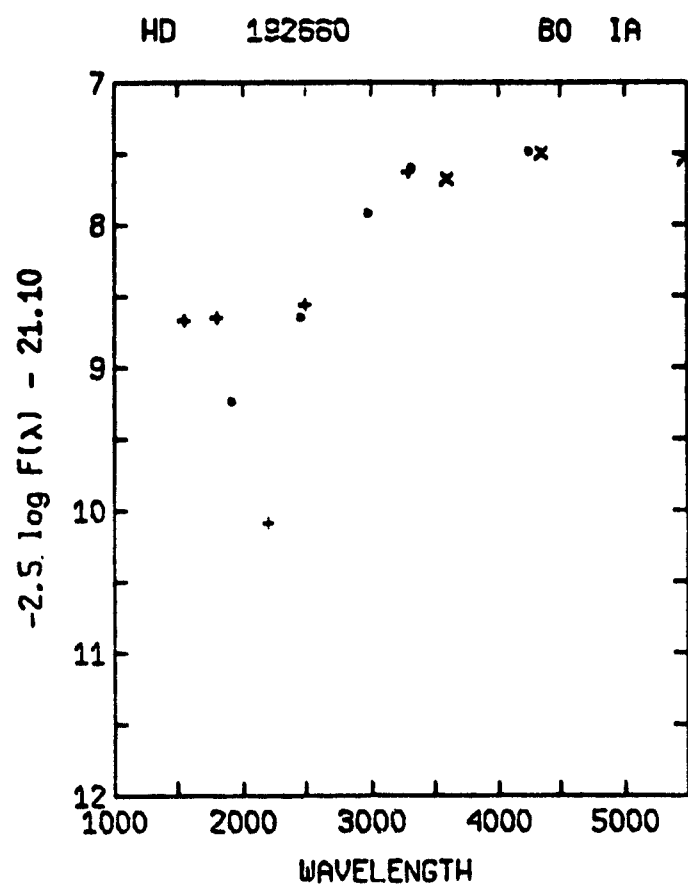
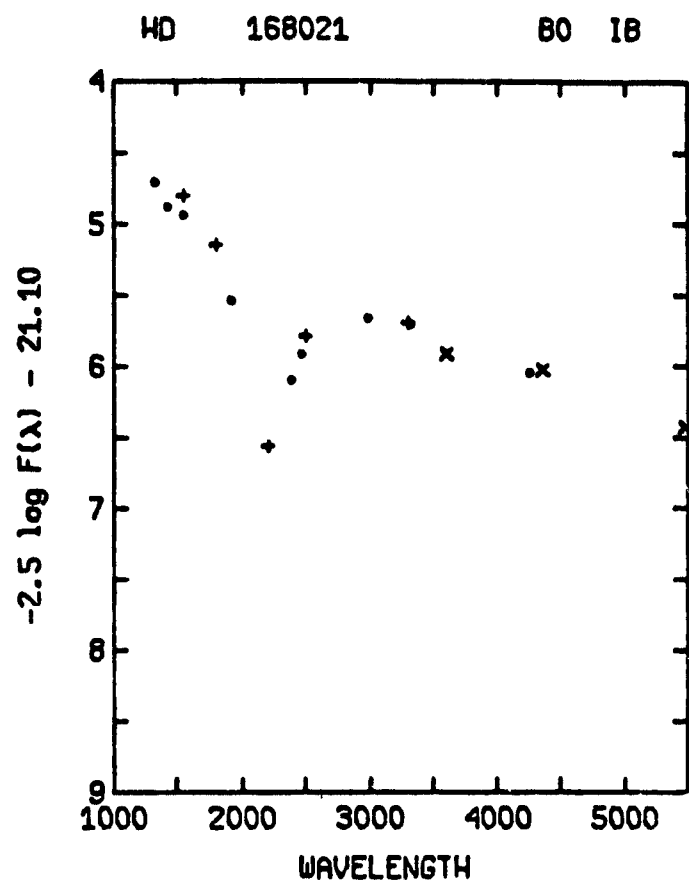
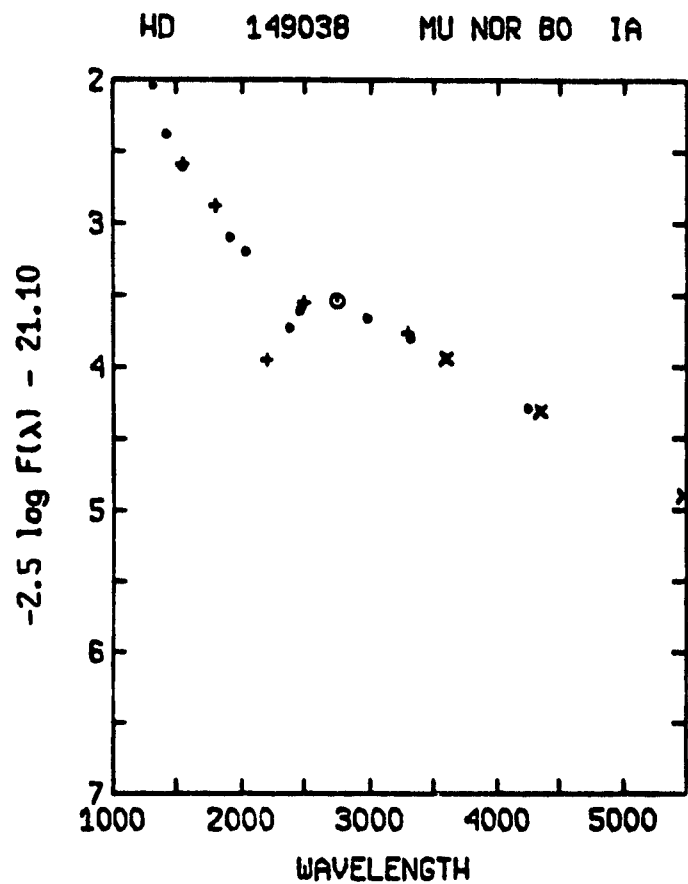
HD 75821 B0 III



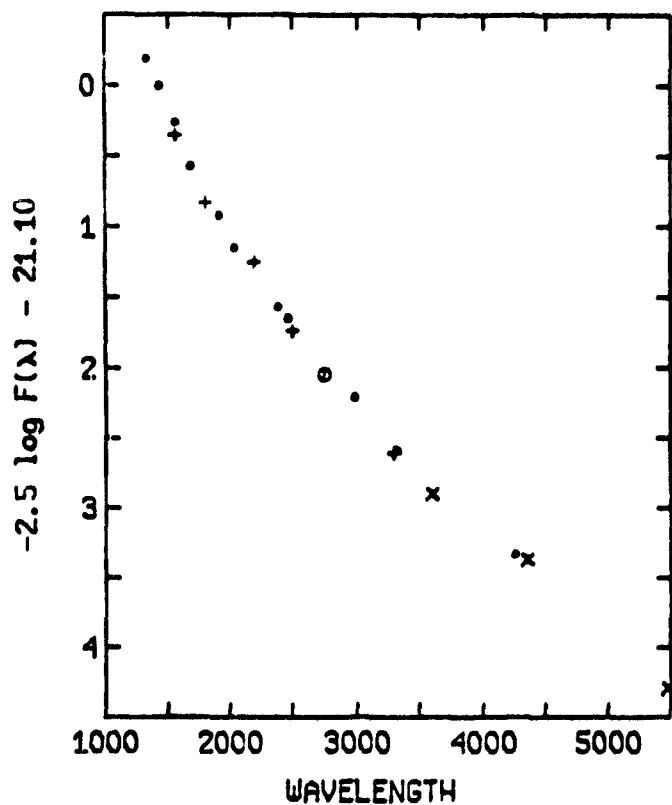
BO stars
D5-D8



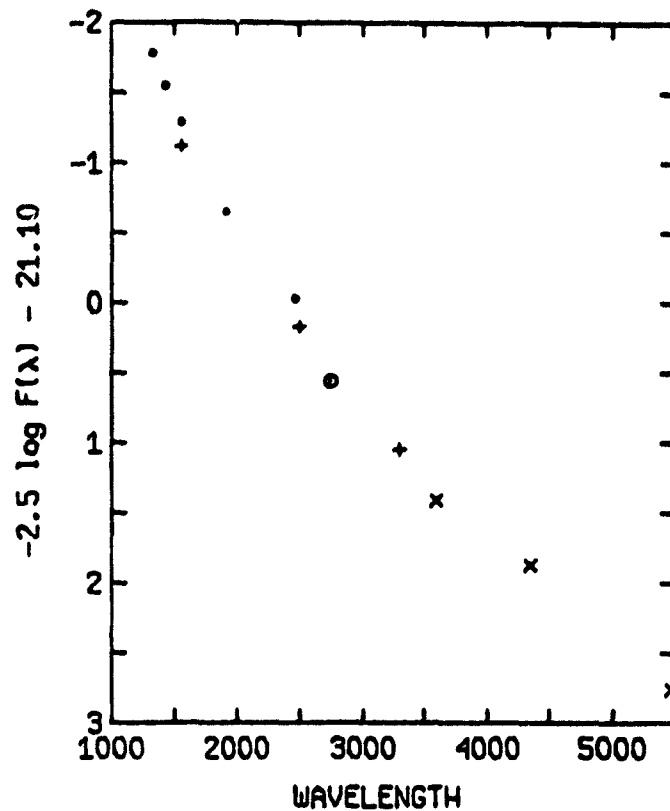




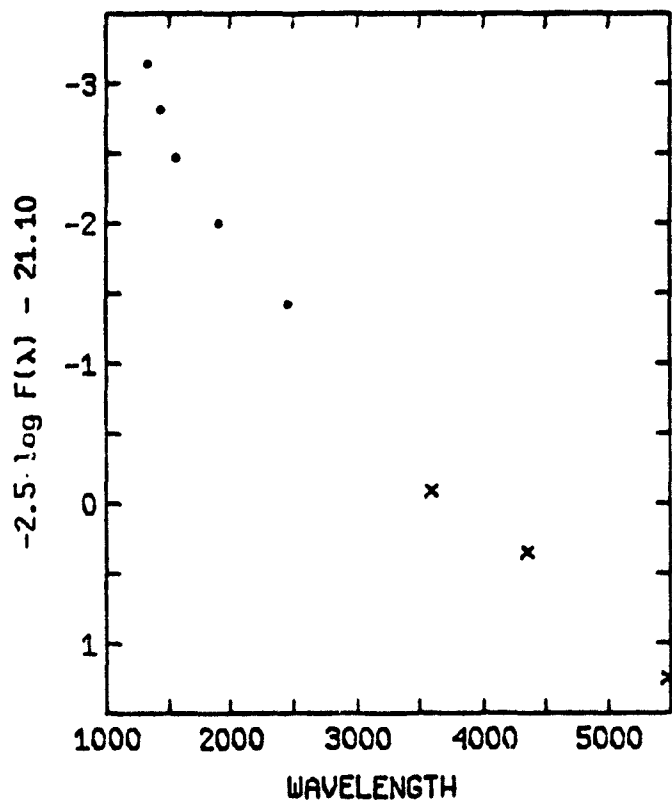
HD 34816 LAM LEP B0.5IV



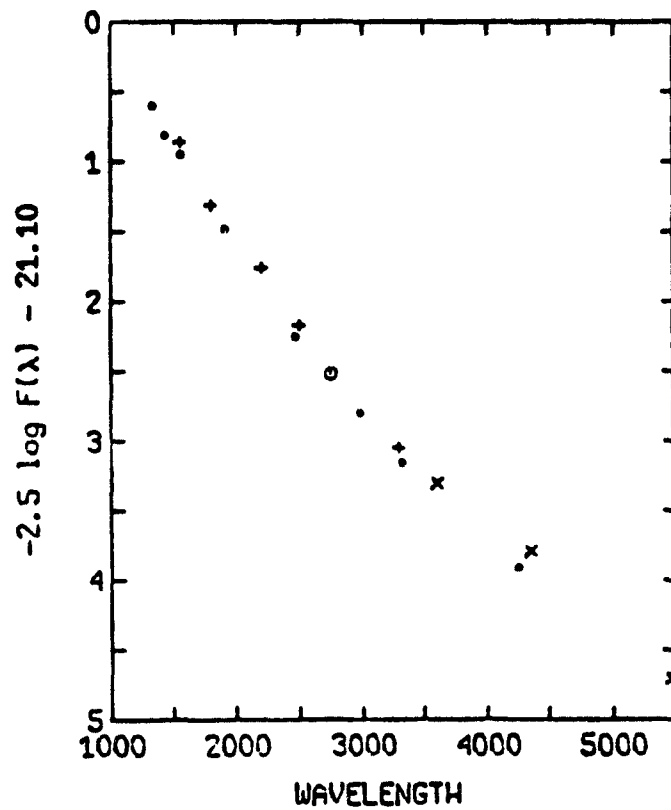
HD 93030 THT CAR B0.5VP

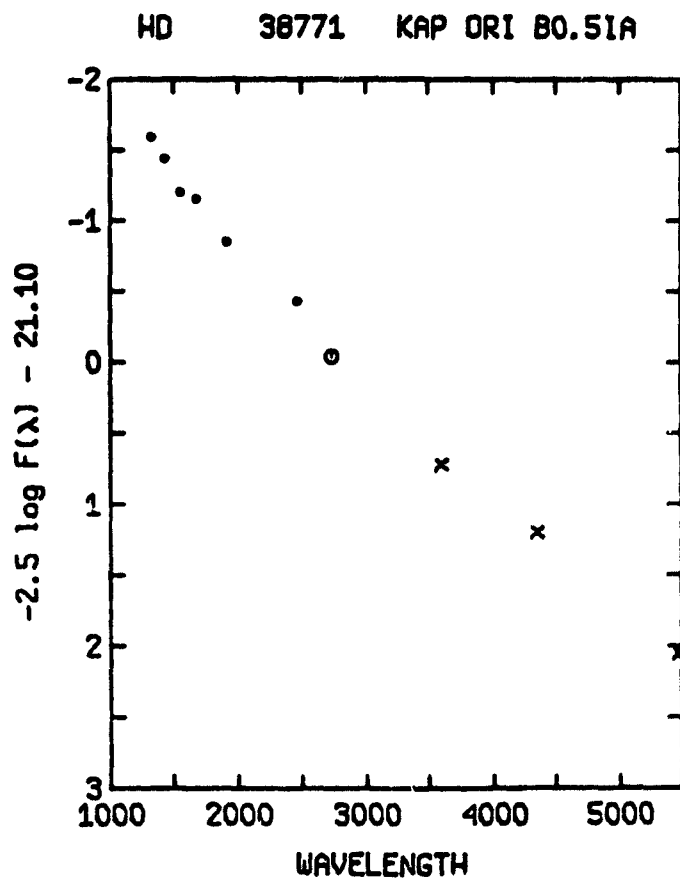
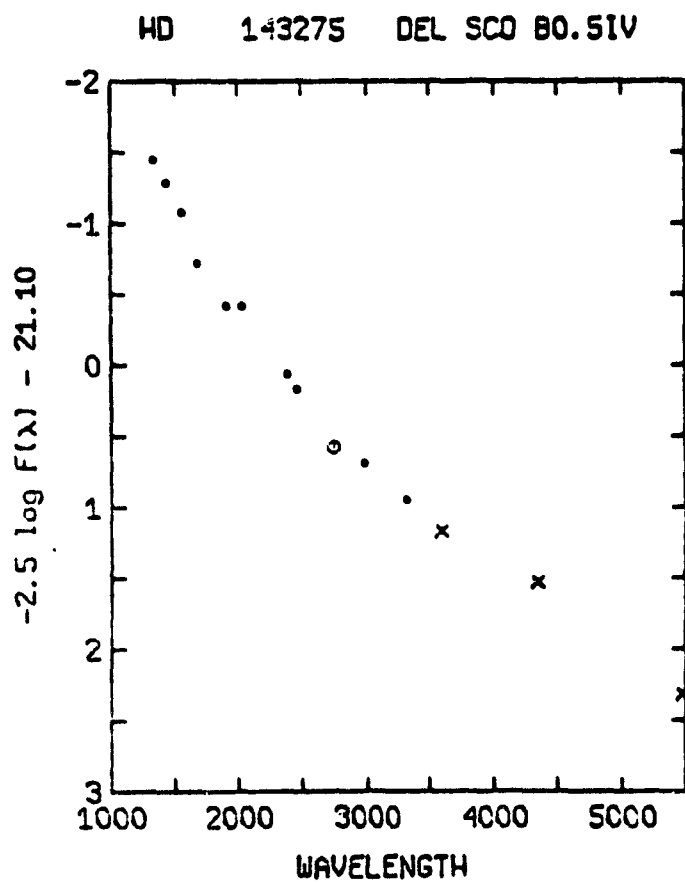
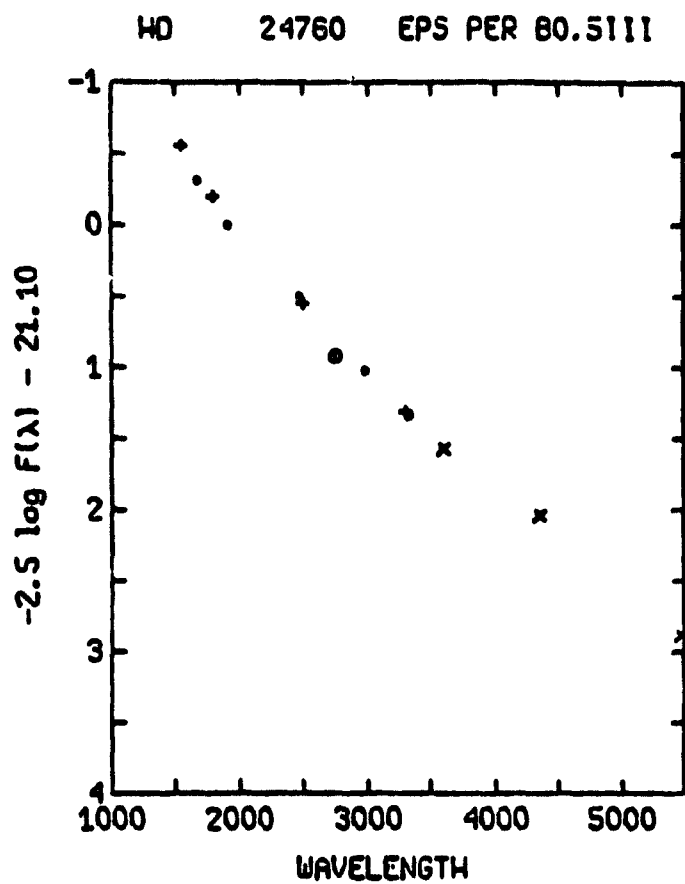
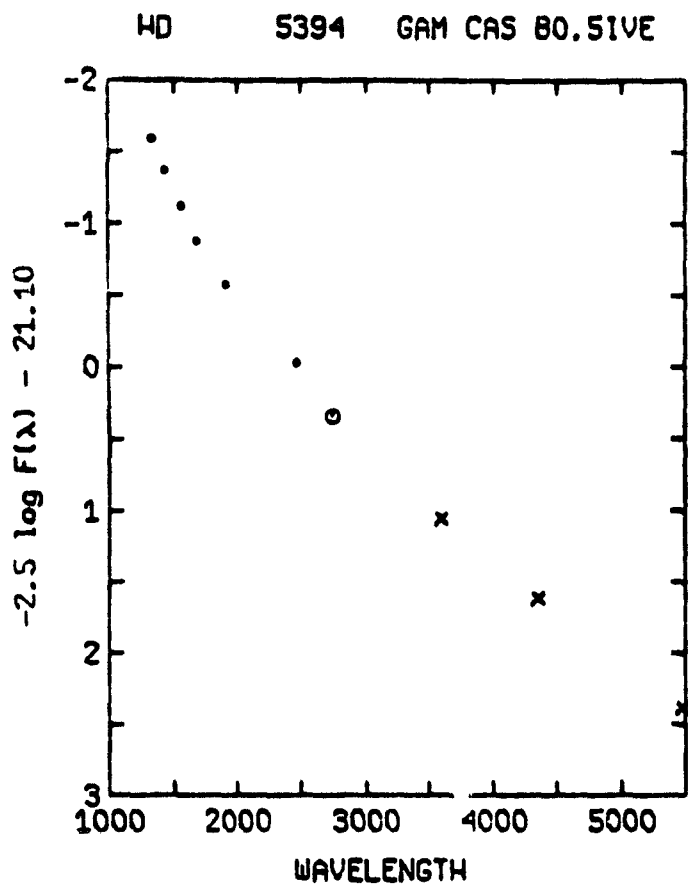


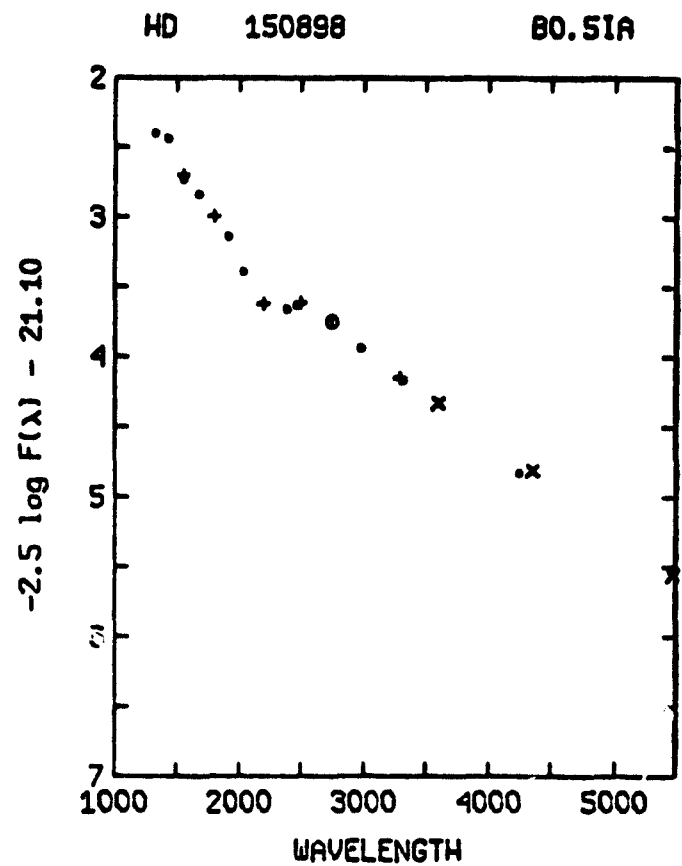
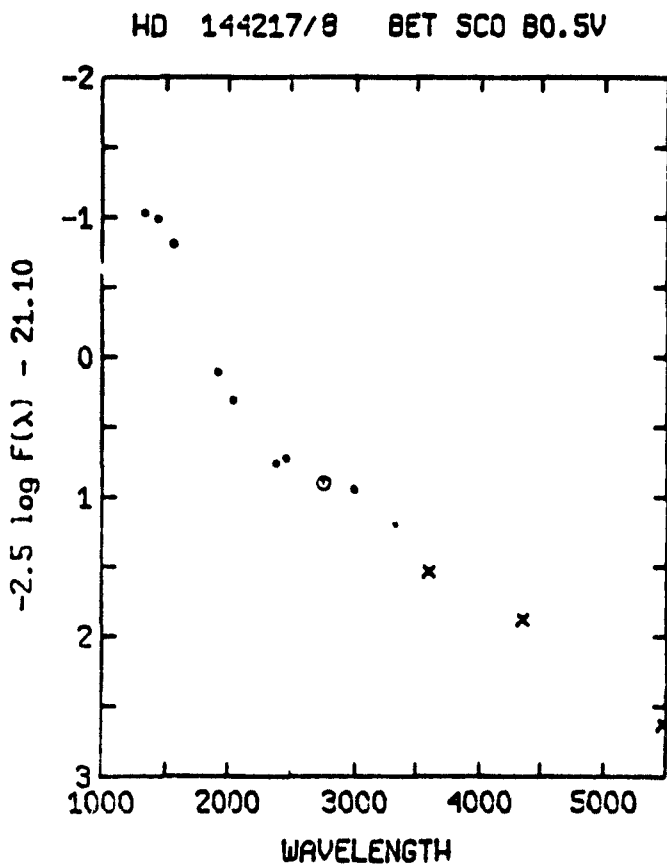
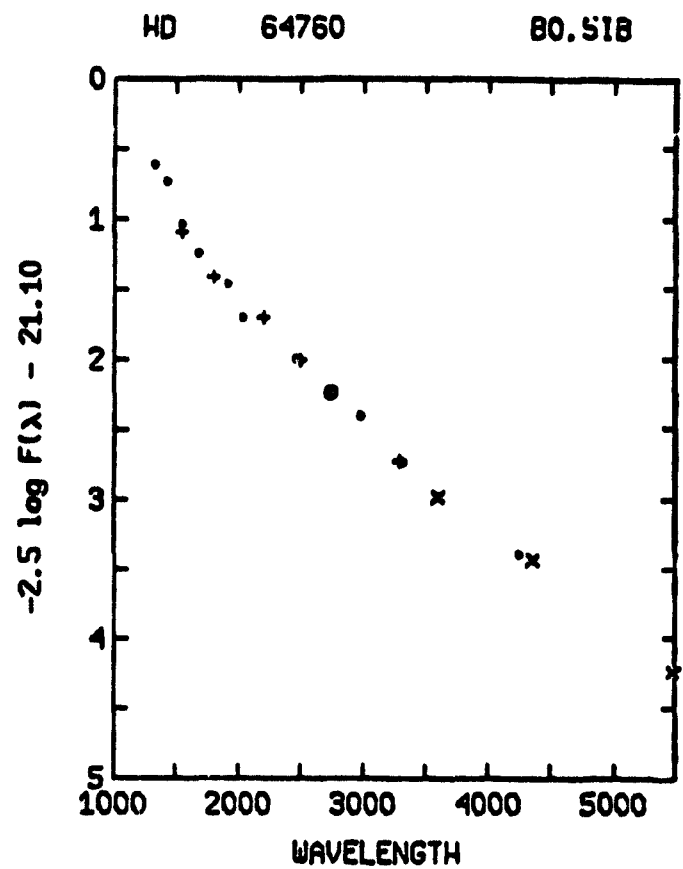
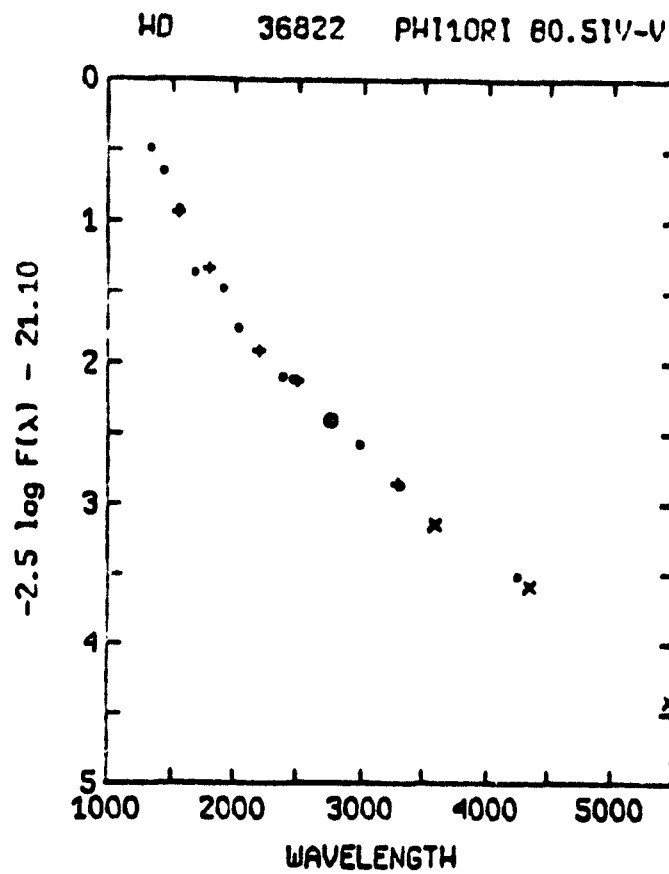
HD 111123 BET CRU B0.5III



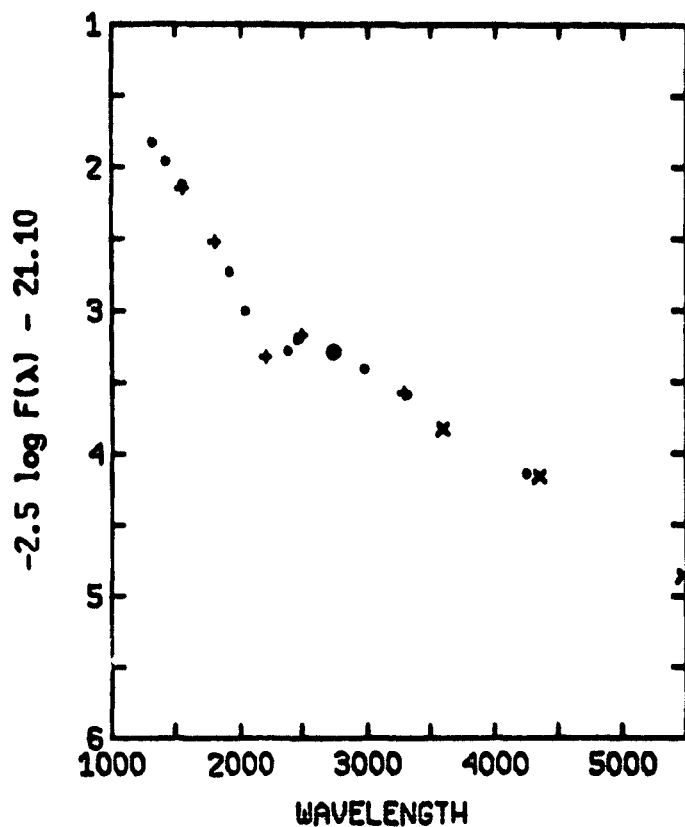
HD 42933 DEL PIC B0.5IV



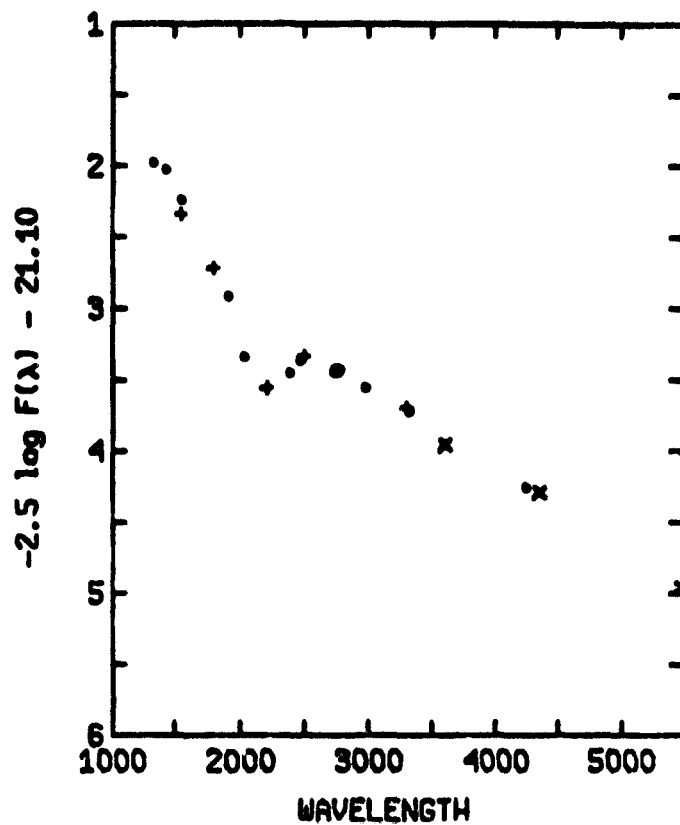




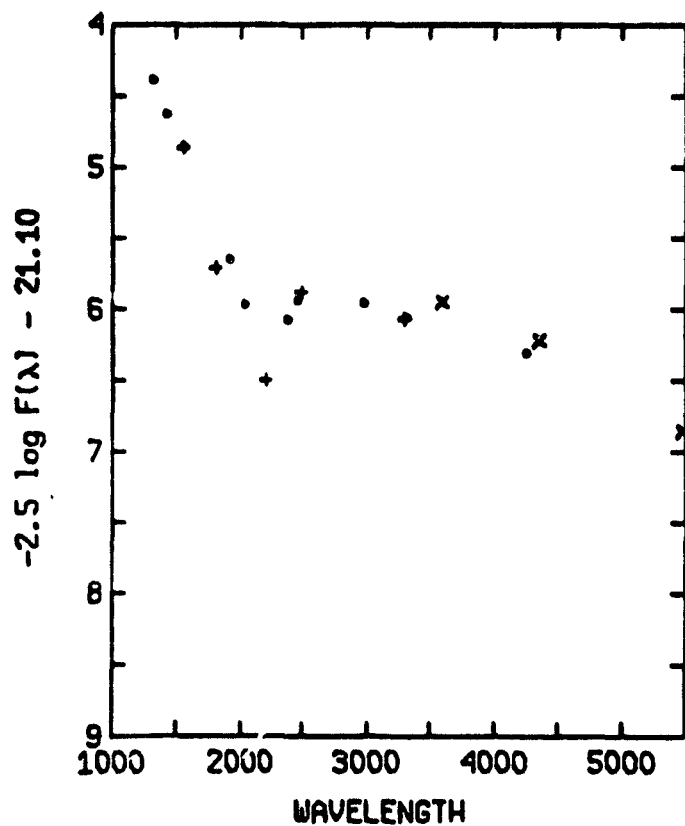
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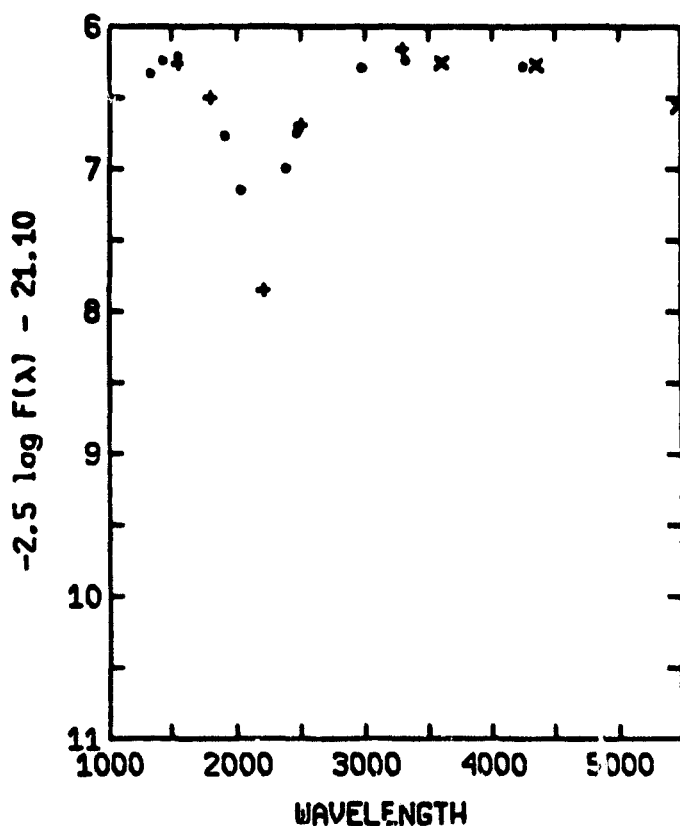
HD 184915 KAP AQL B0.5III

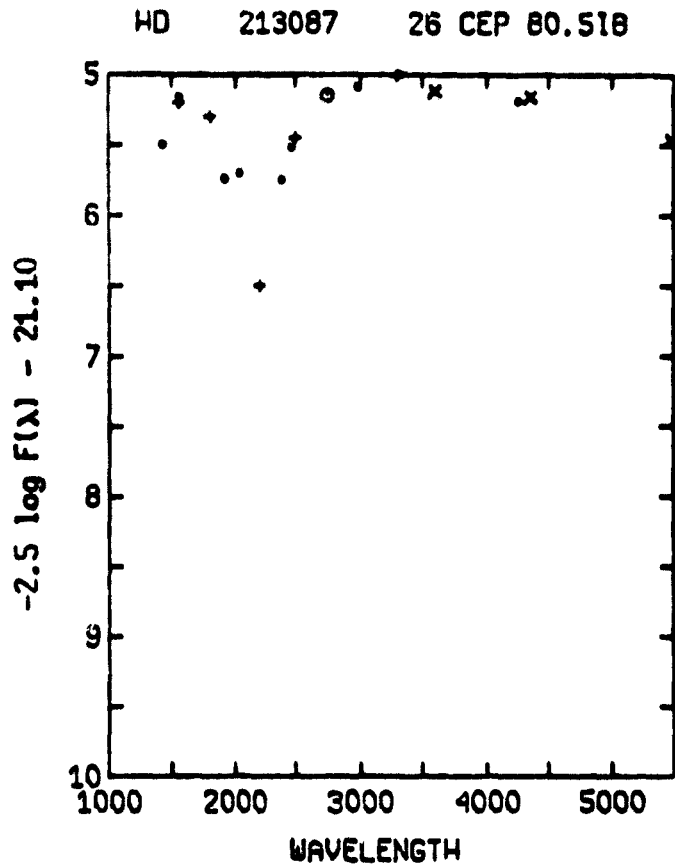


HD 184279 B0.5IV

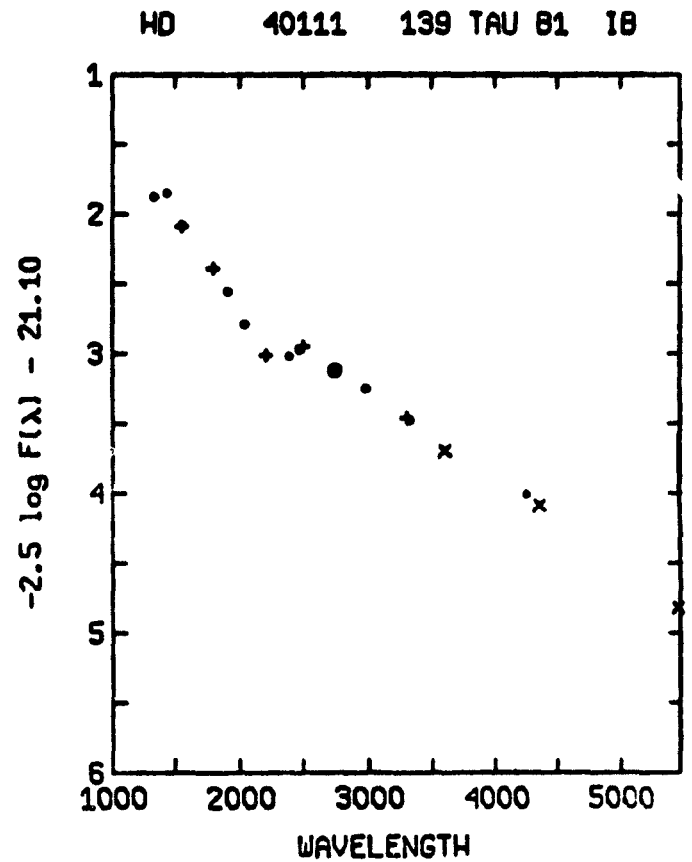
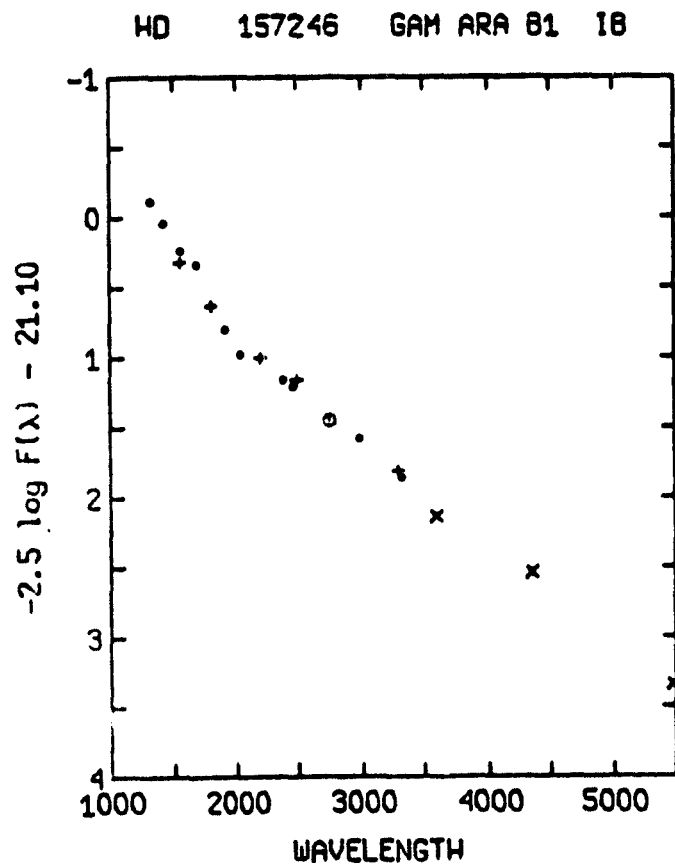


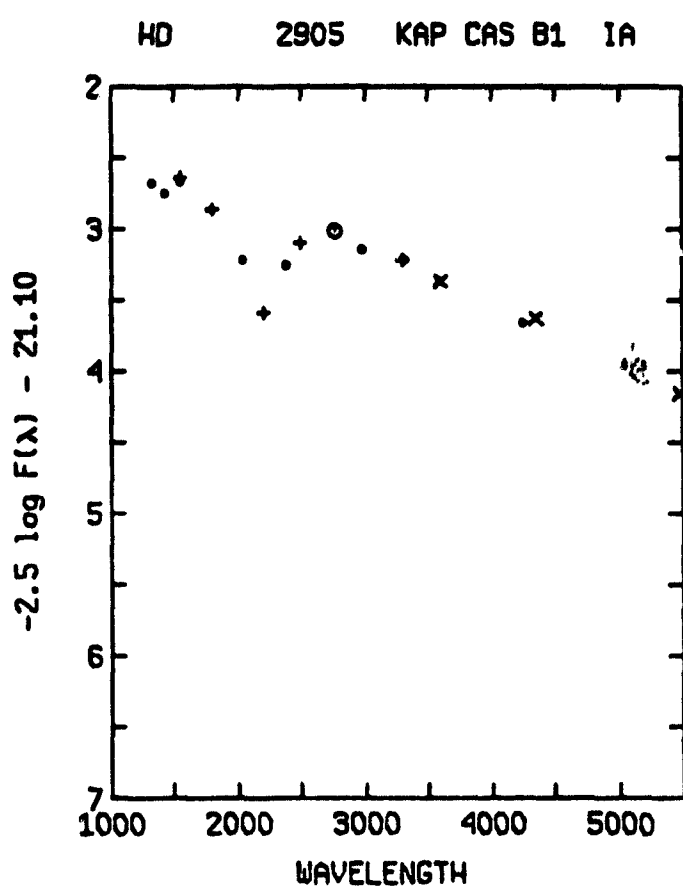
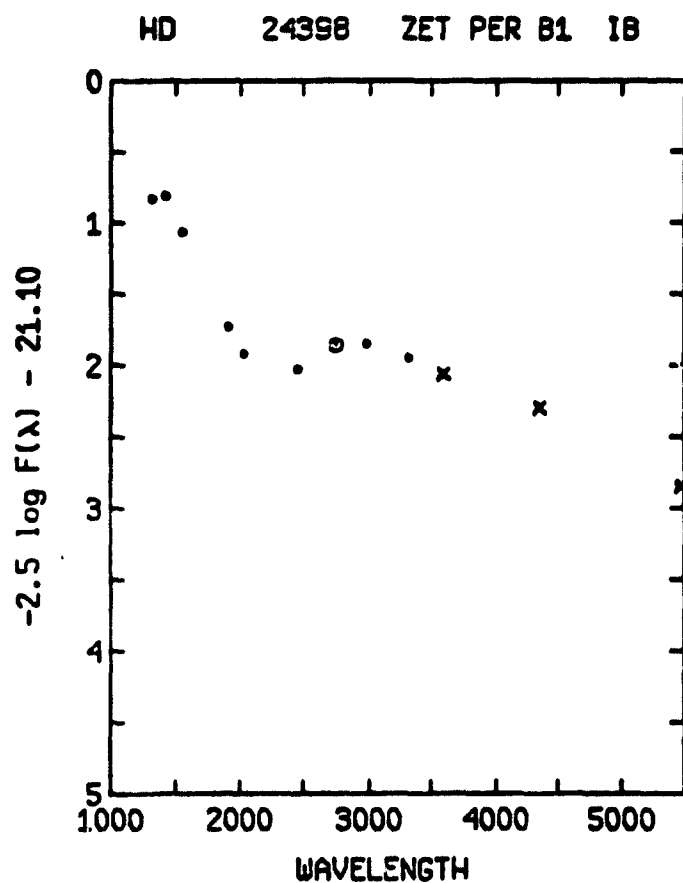
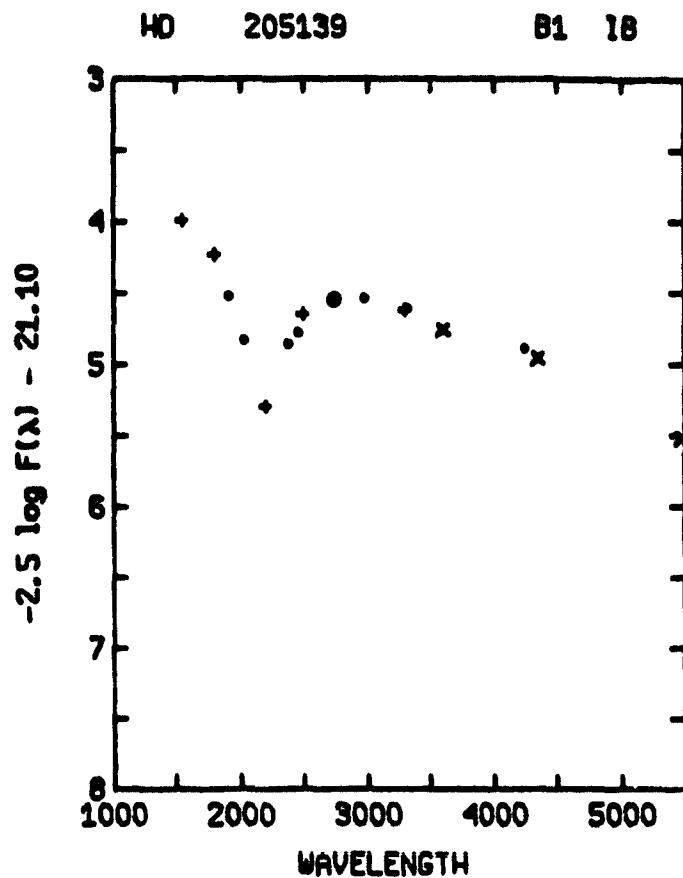
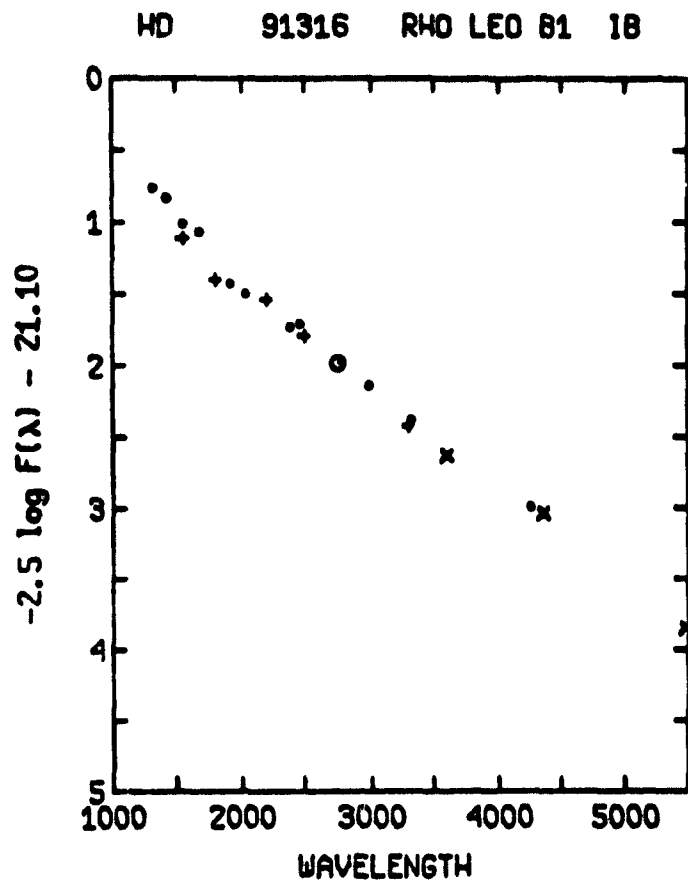
HD 207793 B0.5III





B1 I-II stars
F1-F2





B1 I-II stars

HD 47240

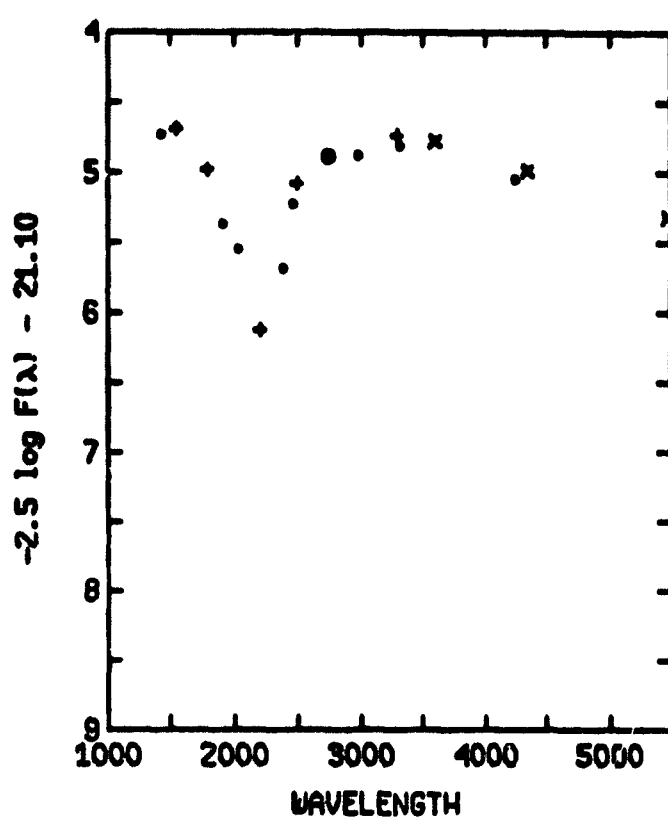
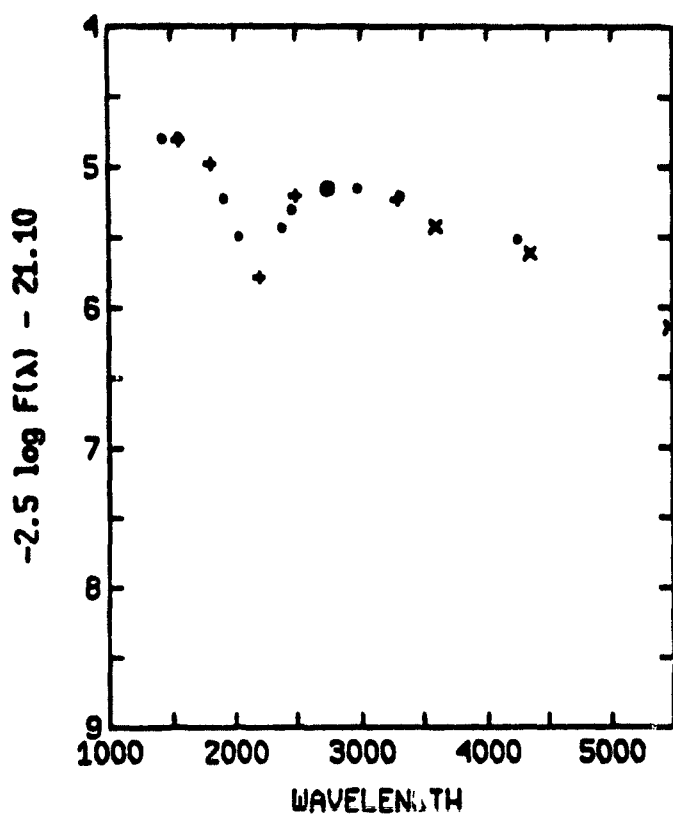
B1 II

F7-F10

HD

148588

B1 IA⁺



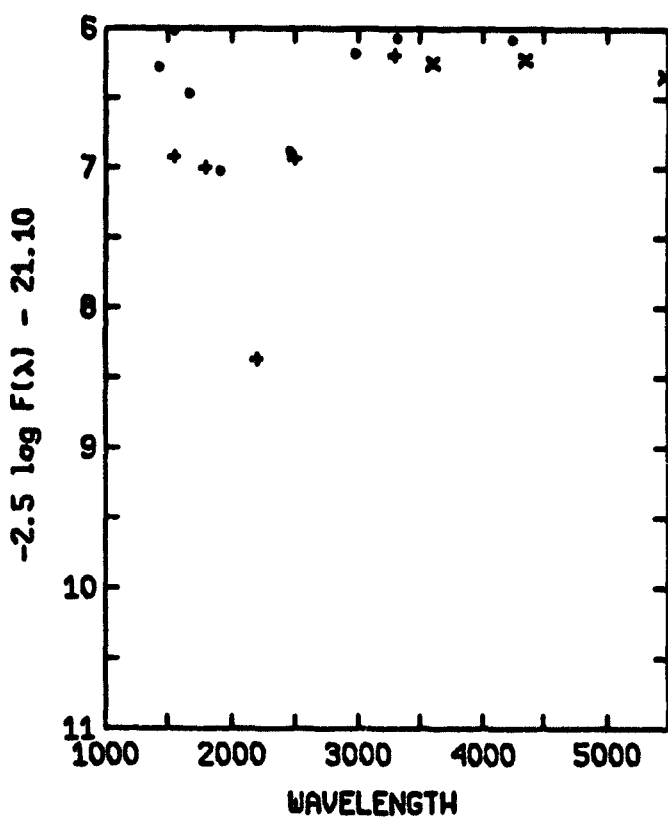
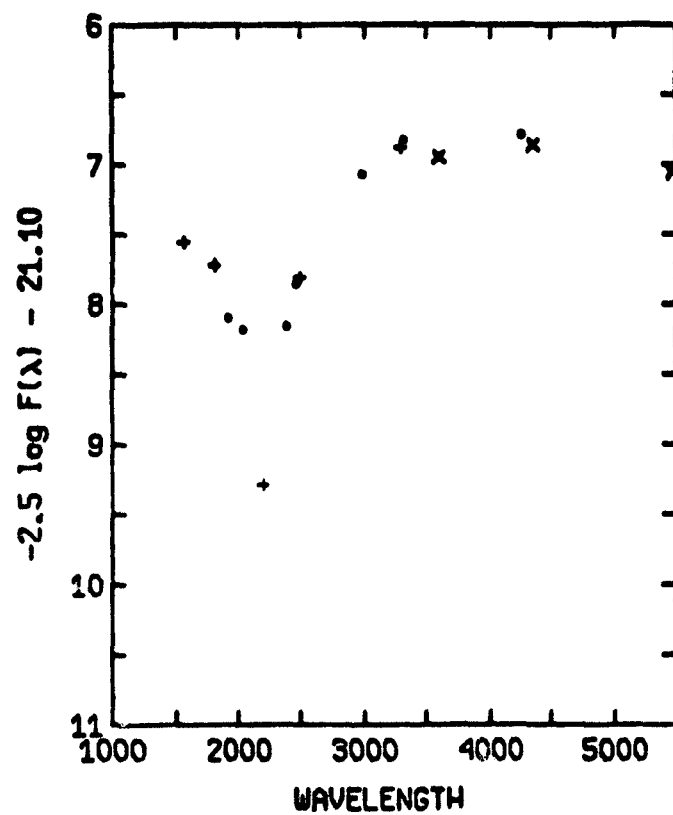
HD 199216

B1 II

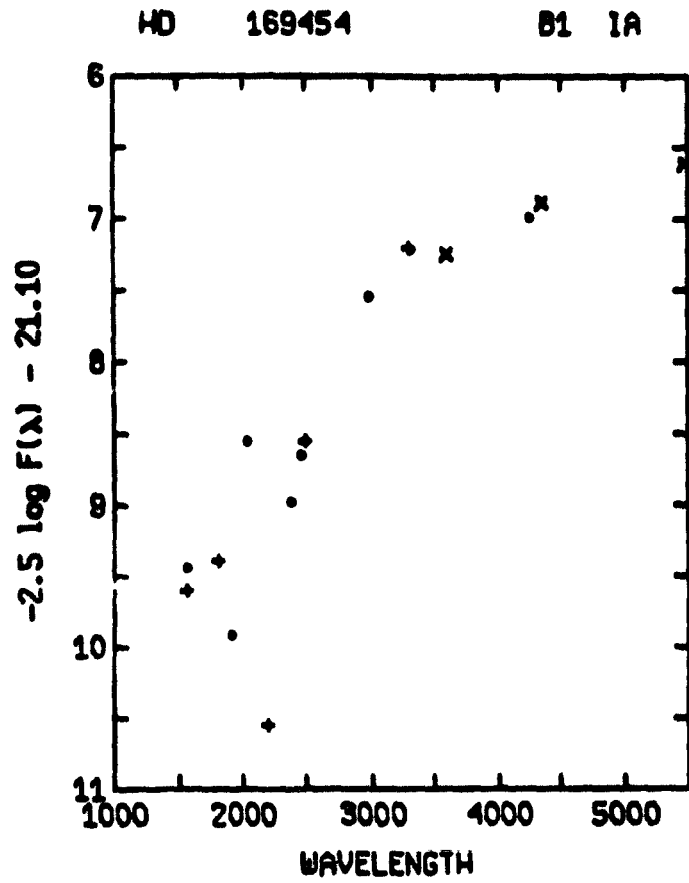
HD

152235

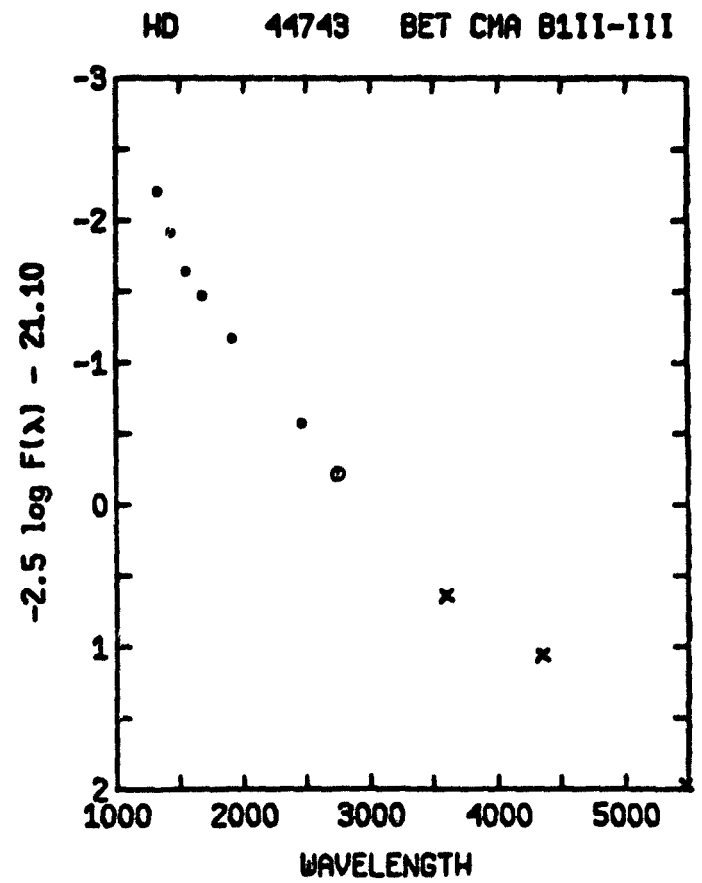
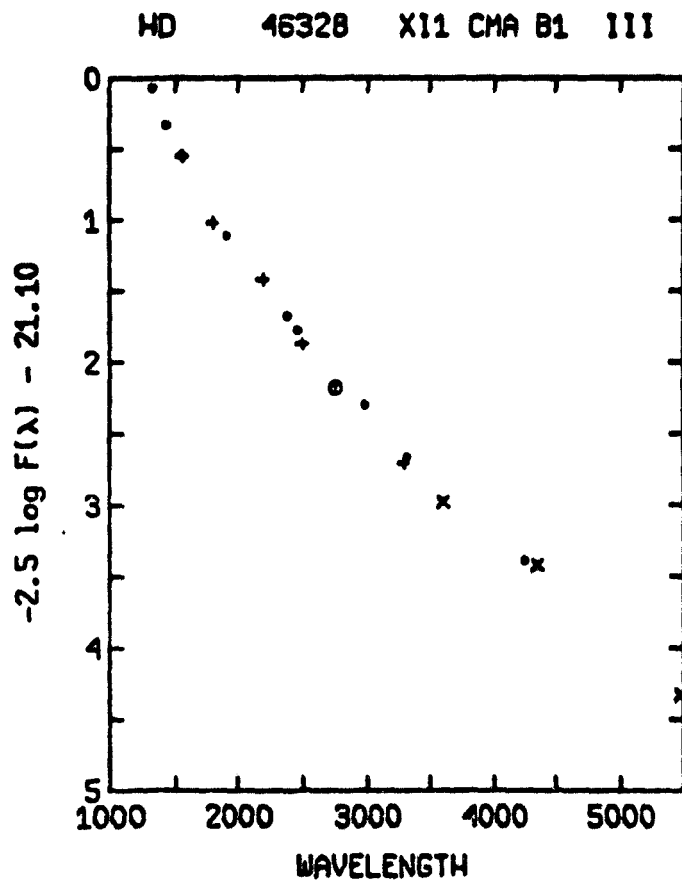
B1 IA



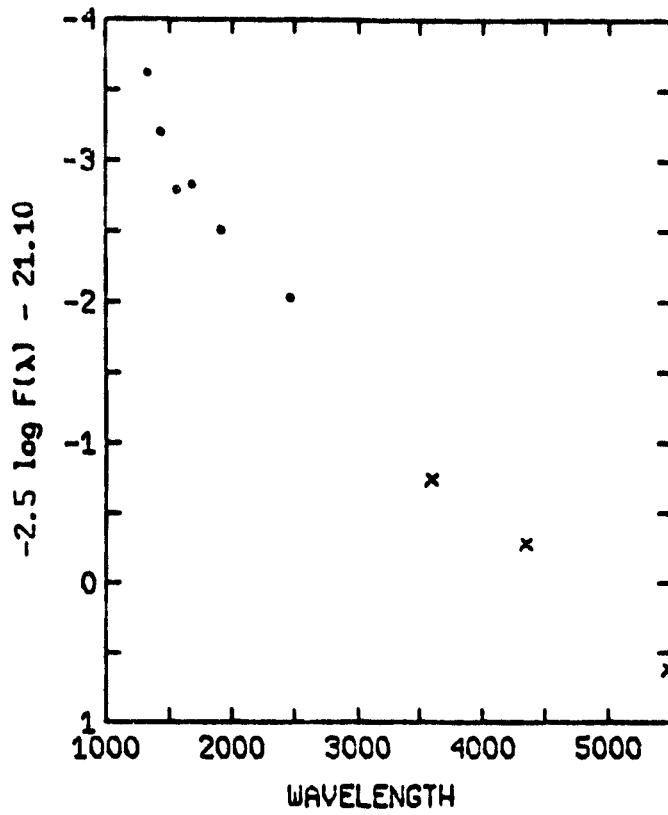
B1 I-II stars
F11



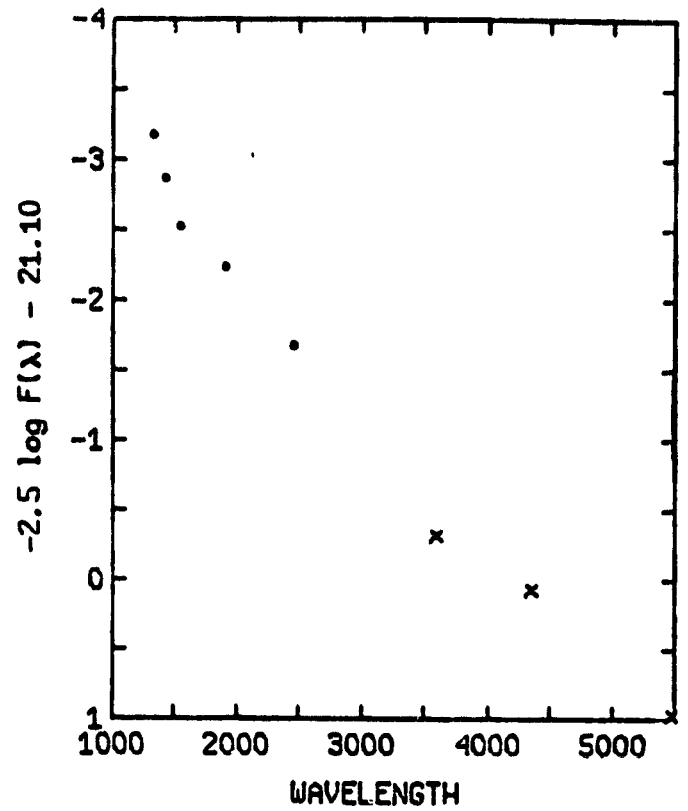
B1 III-V stars
G1-G2



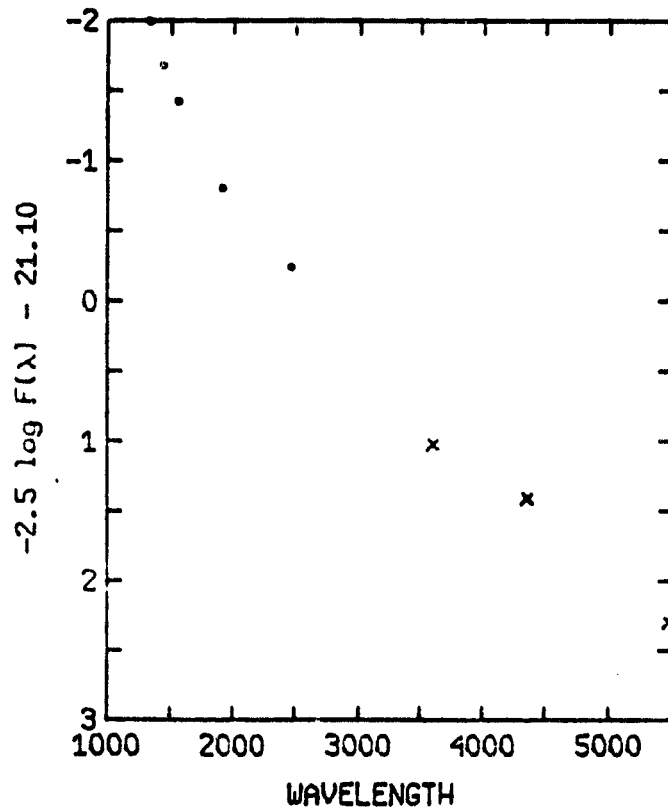
HD 122451 BET CEN B1 III



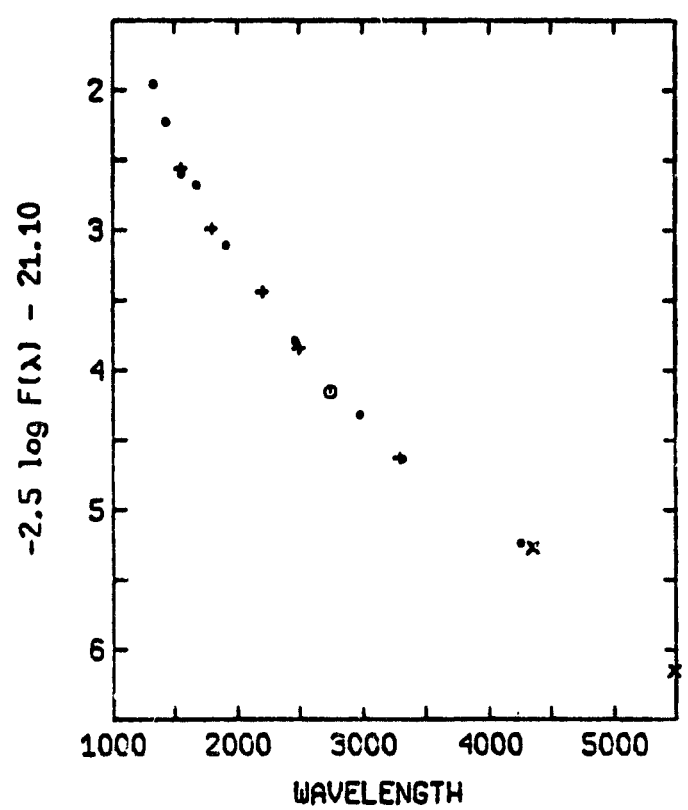
HD 116658 ALF VIR B1 V



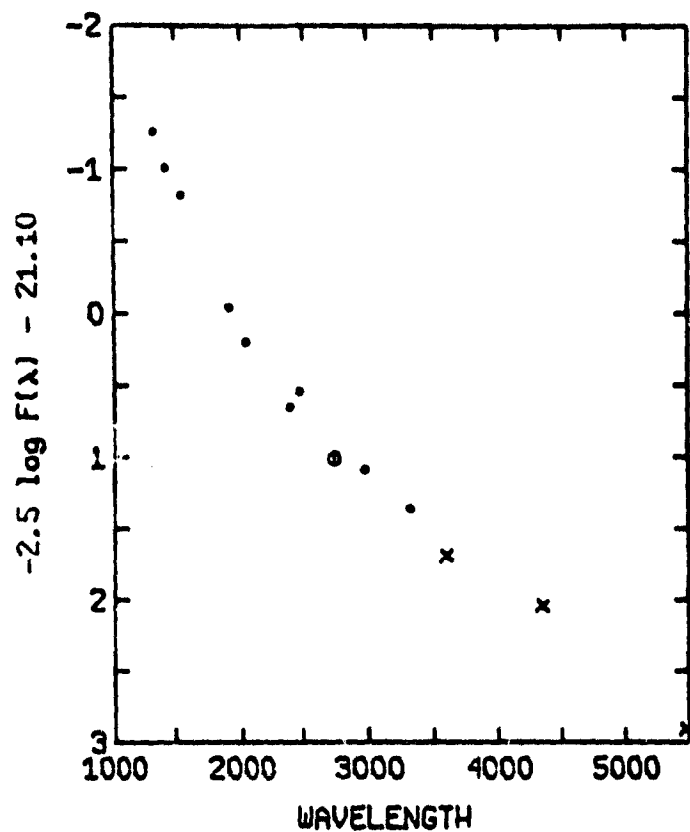
HD 118716 EPS CEN B1 III



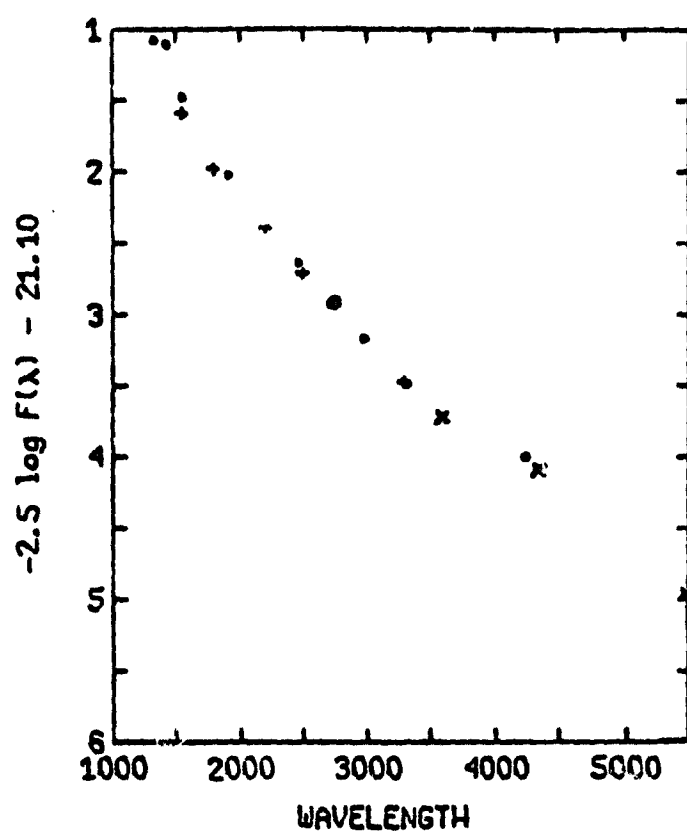
HD 31726 B1 V



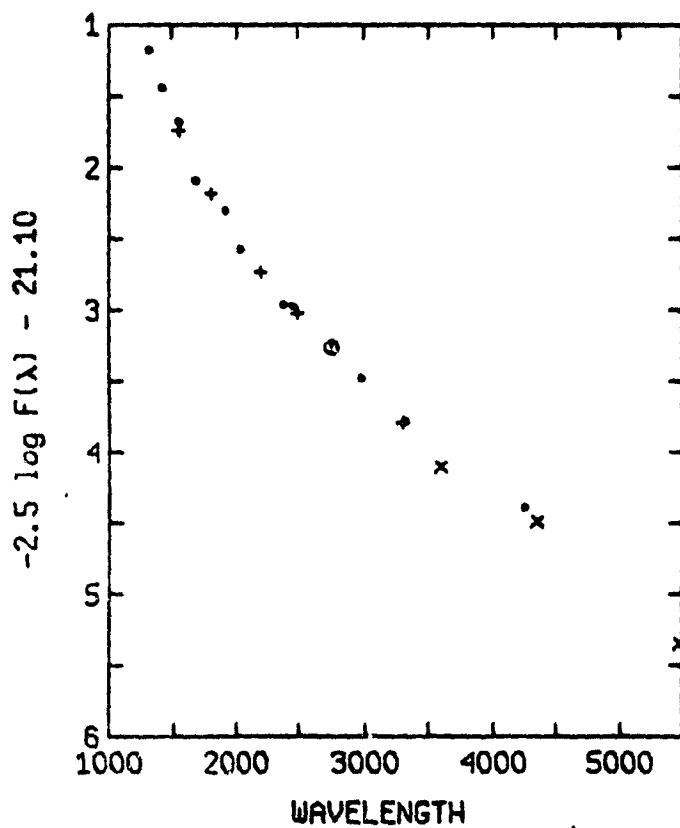
HD 143018 B1 SC0 B1 V



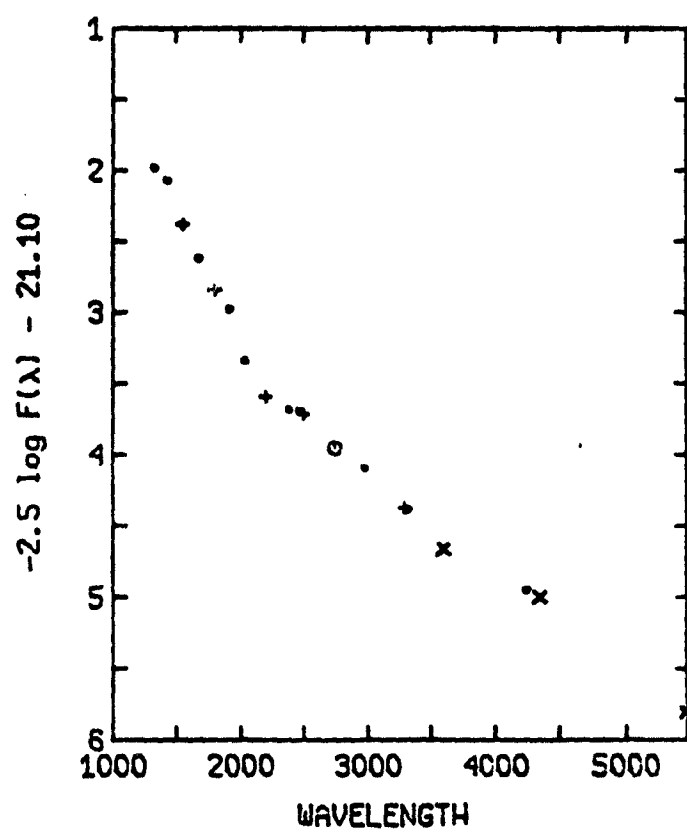
HD 35439 25 ORI B1 VN

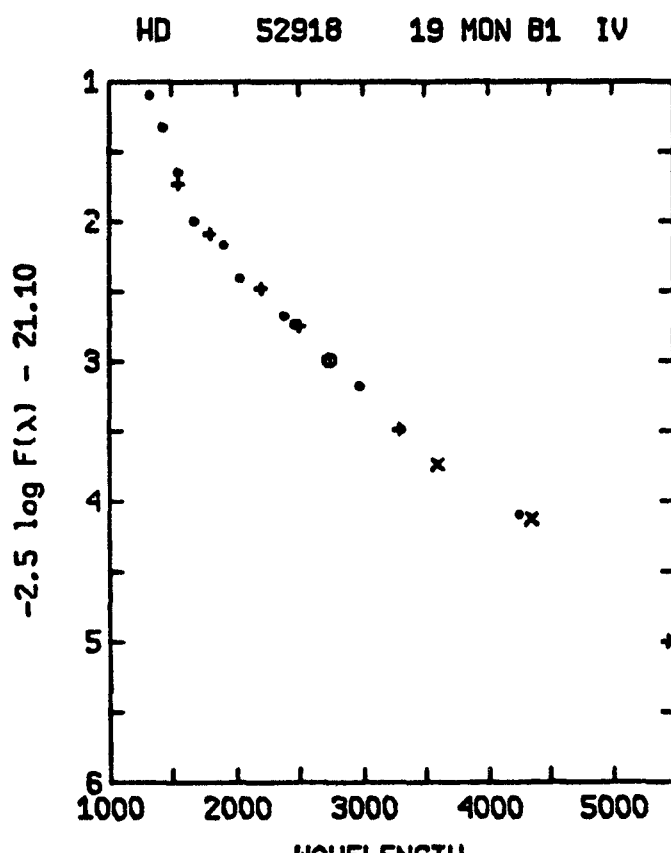
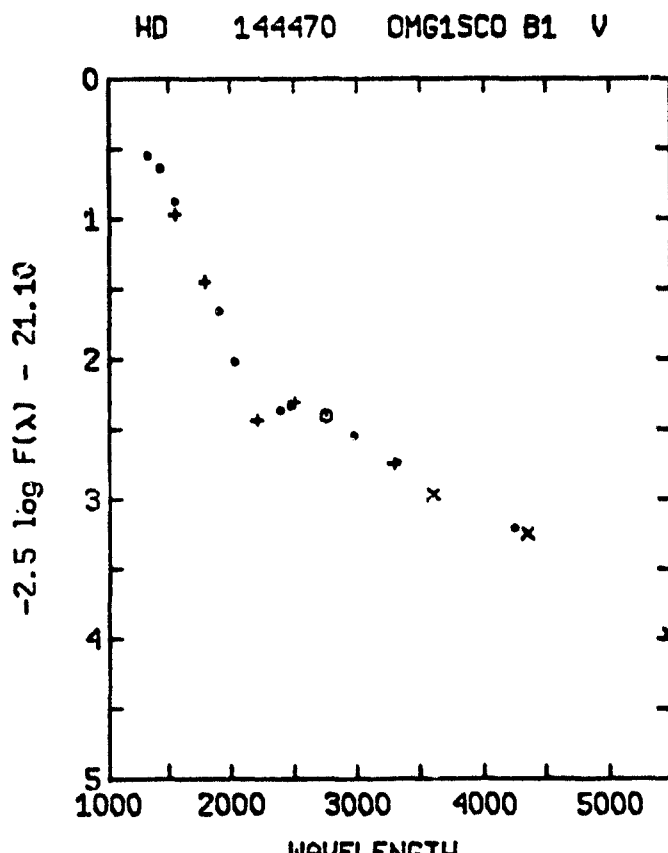
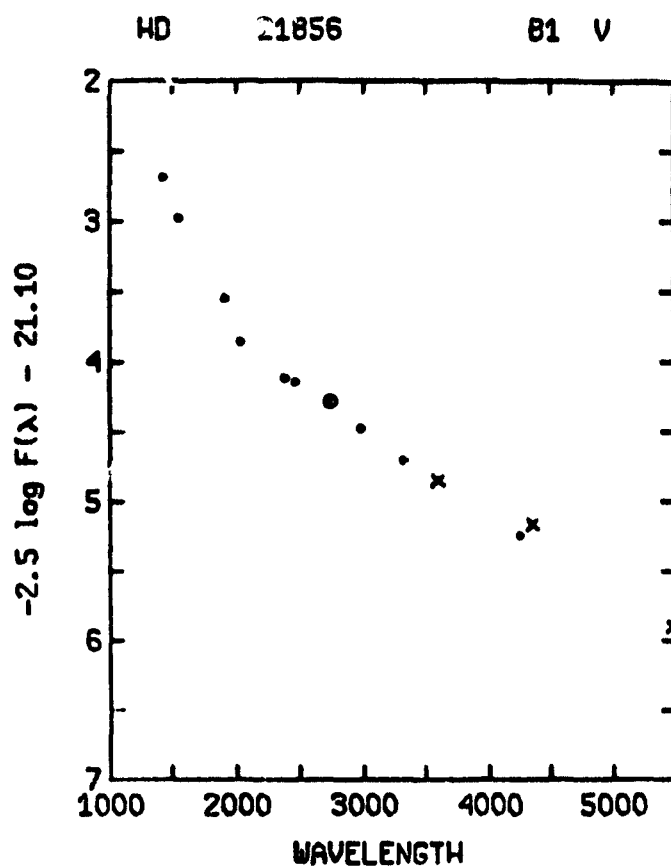
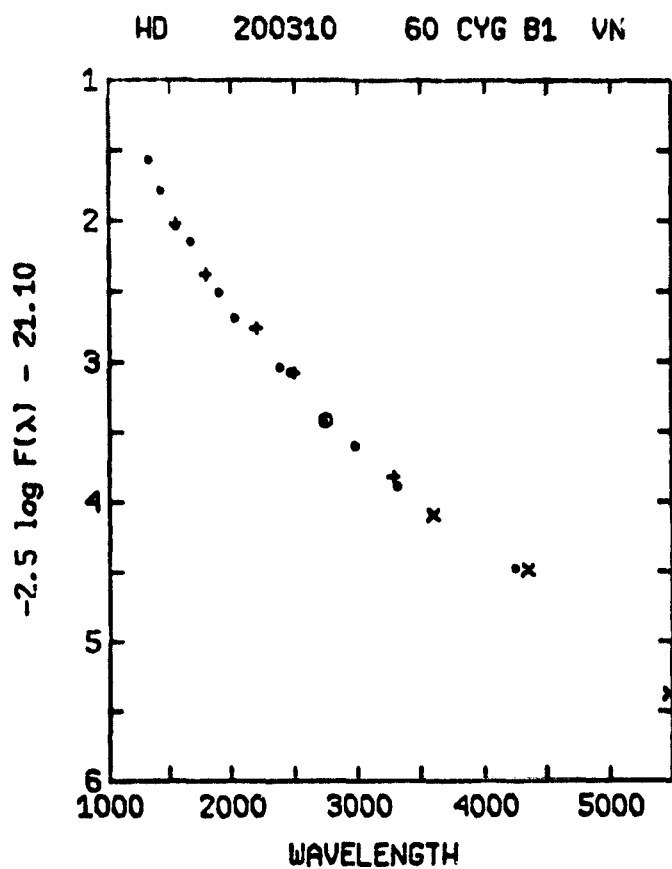


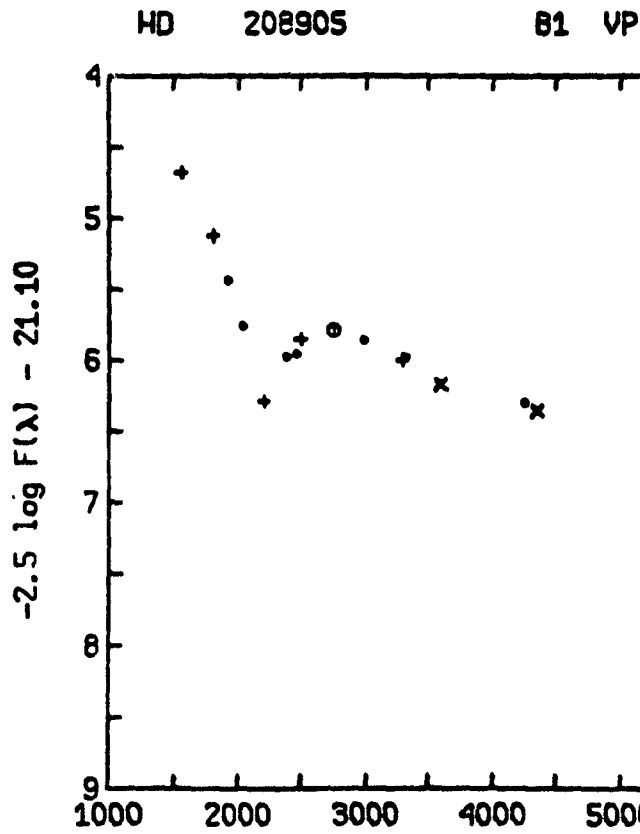
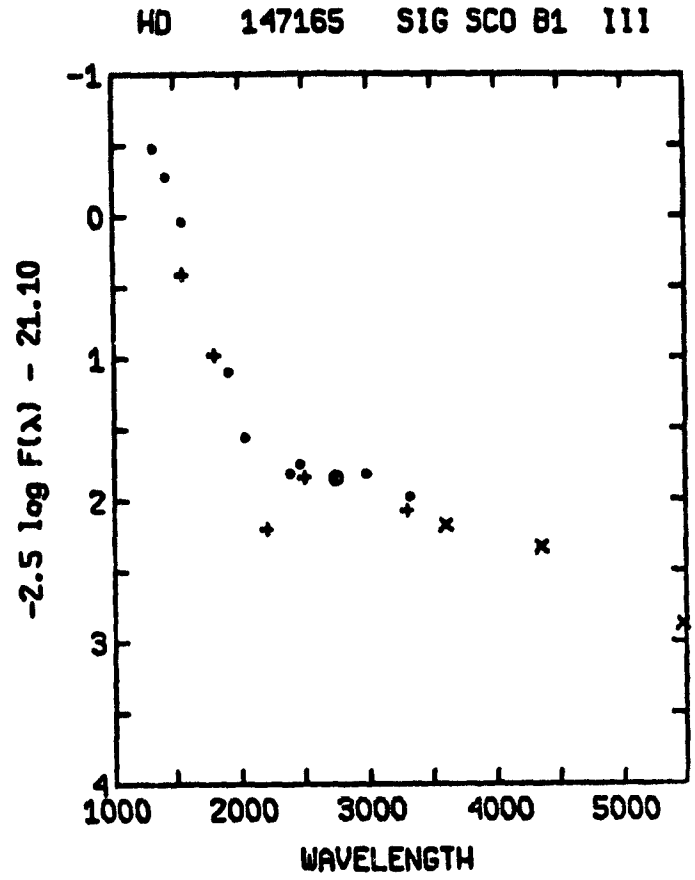
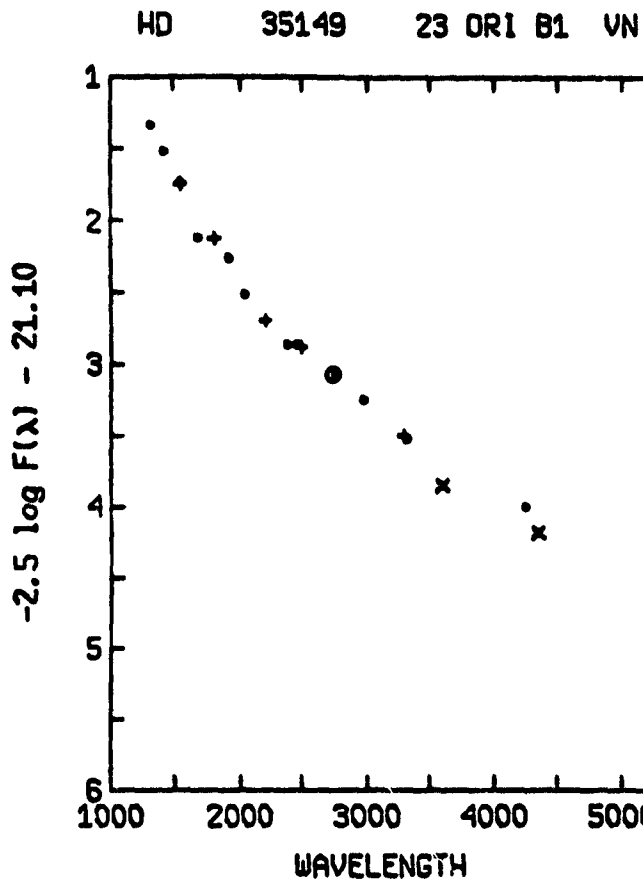
HD 36591 B1 V



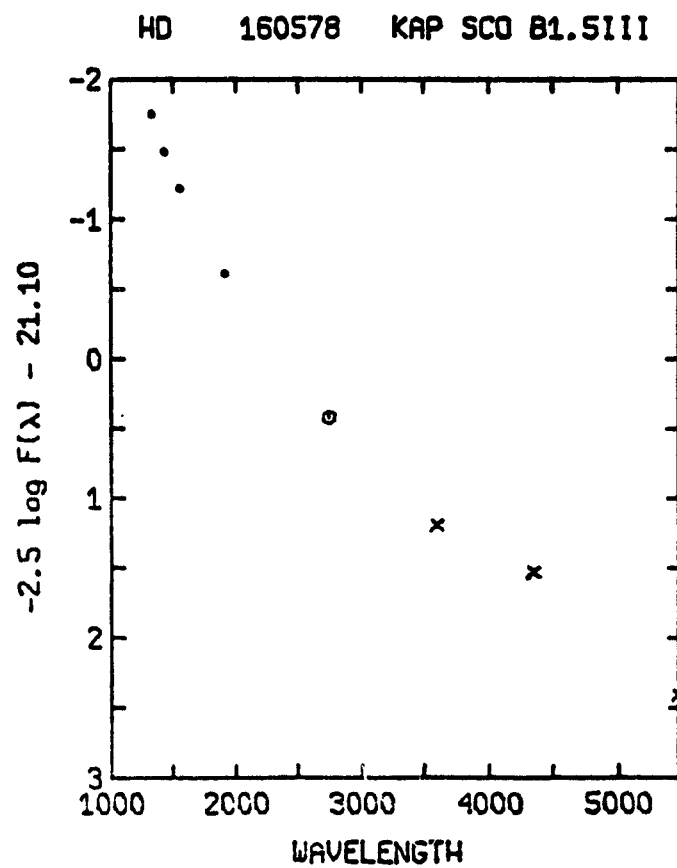
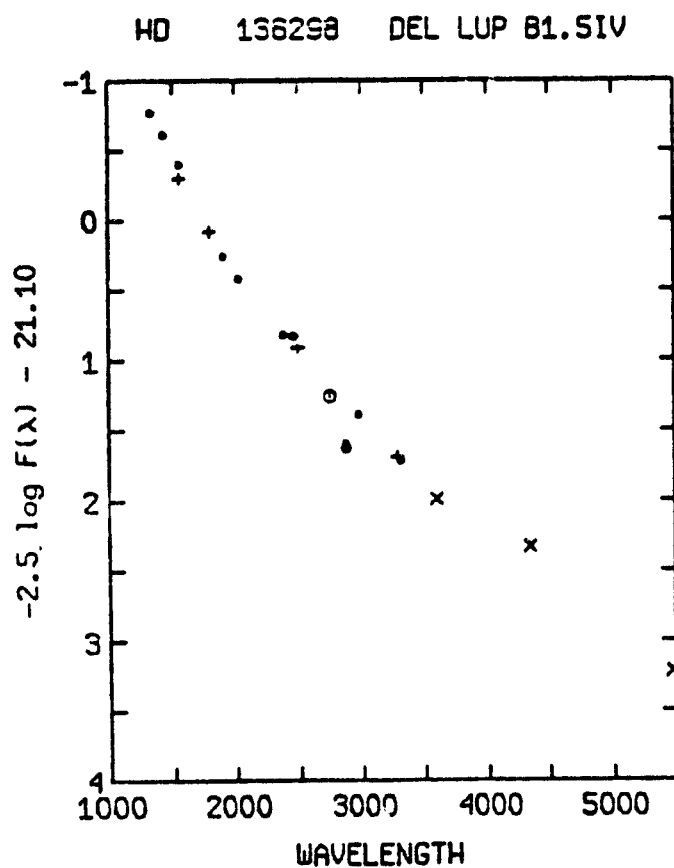
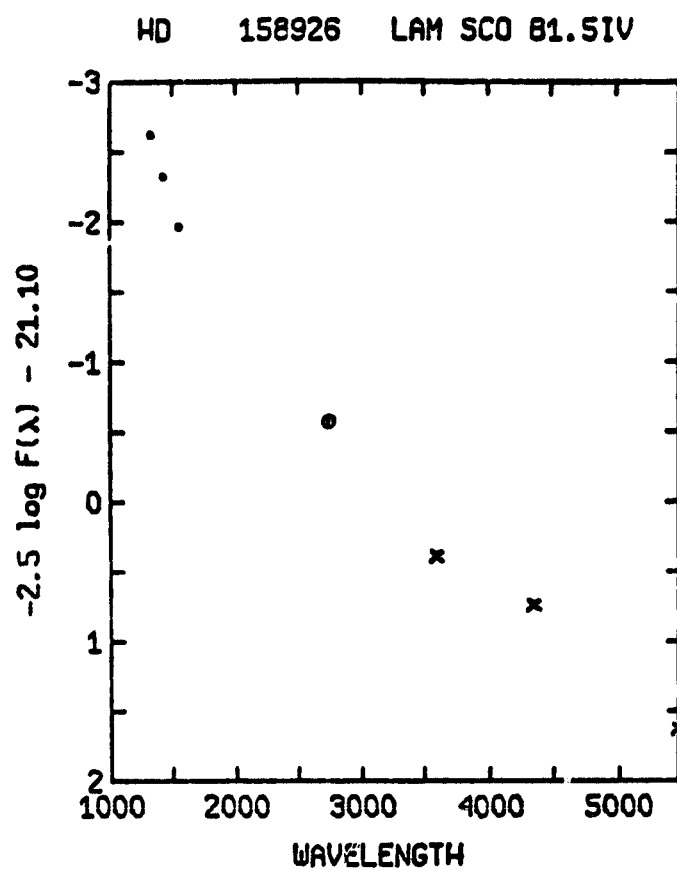
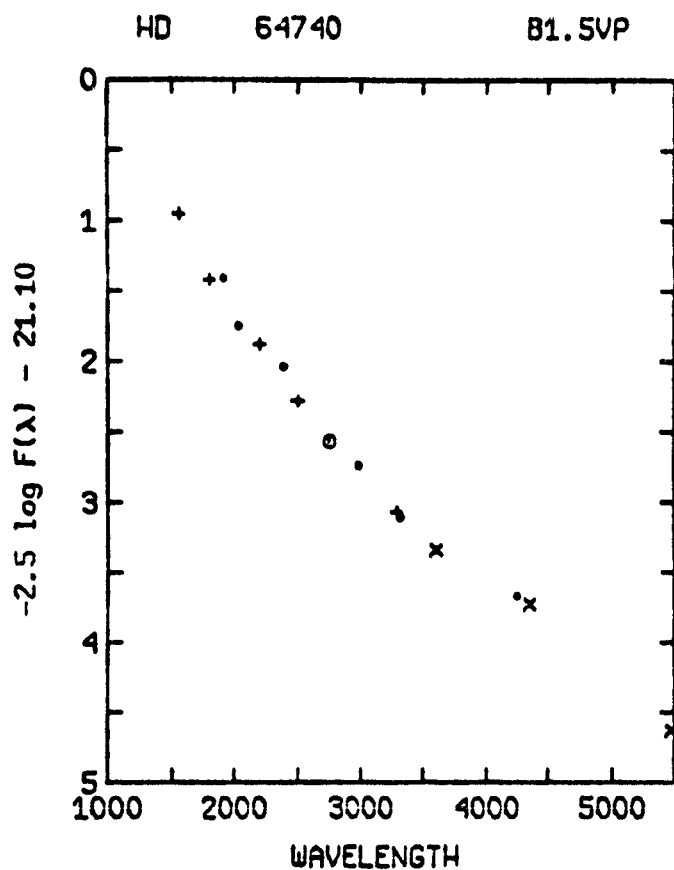
HD 34989 B1 V

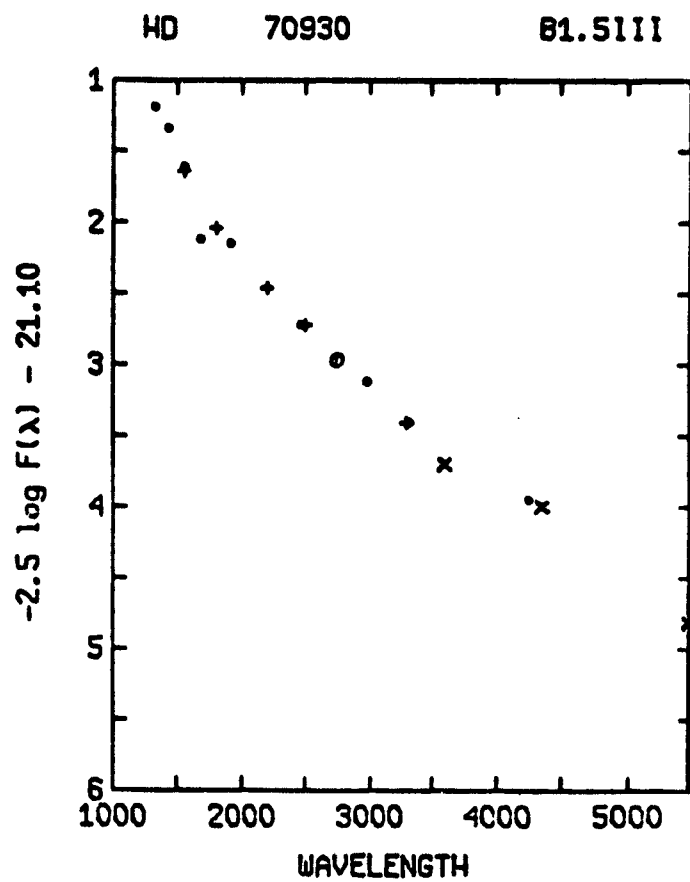
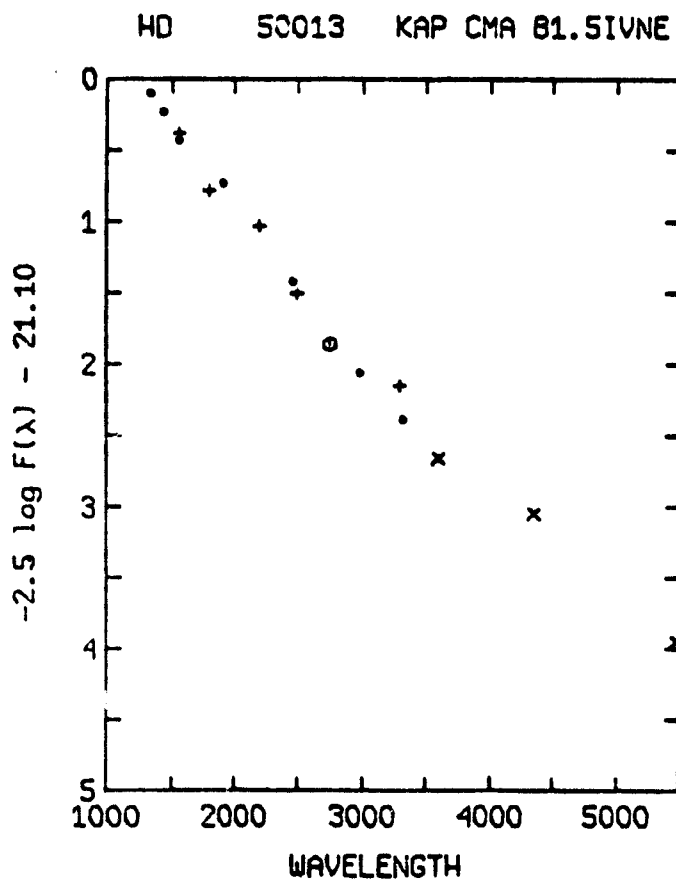
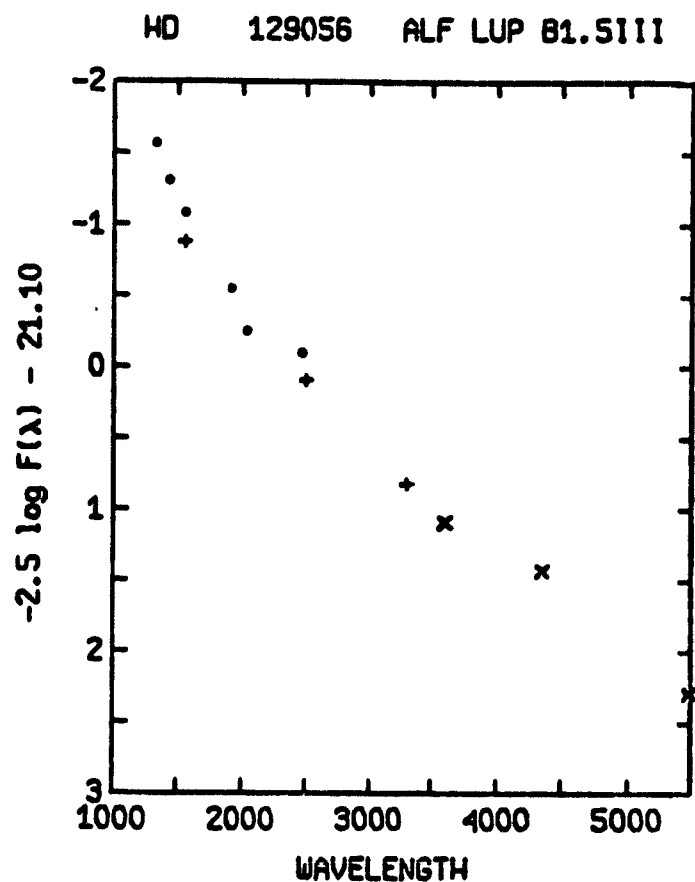
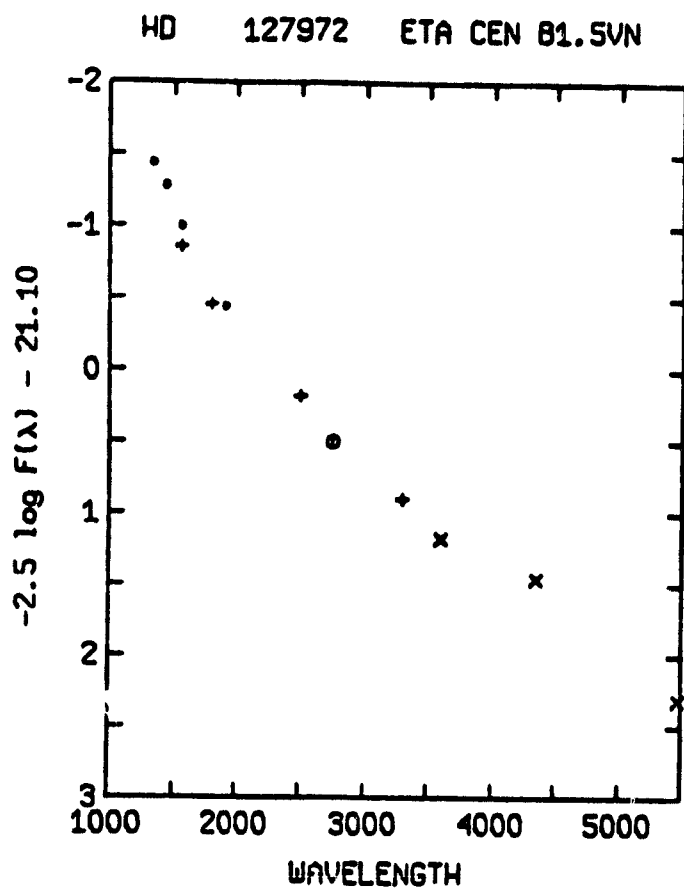






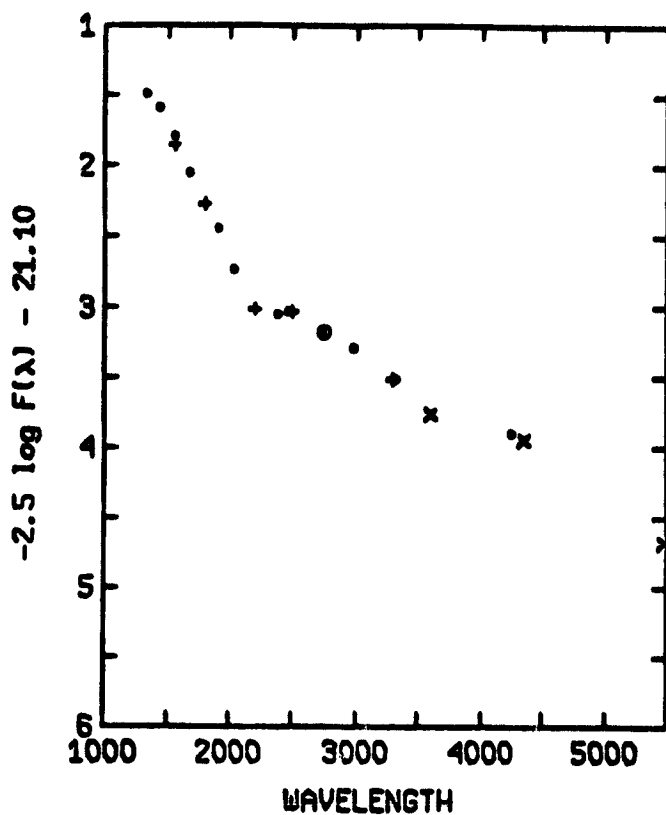
H1-H4



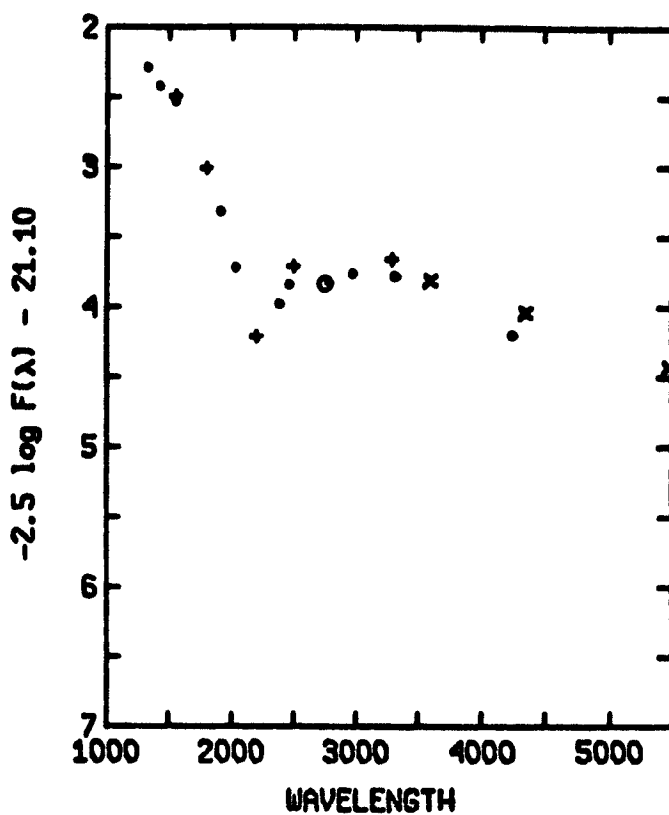


B1.5 stars
H9-H12

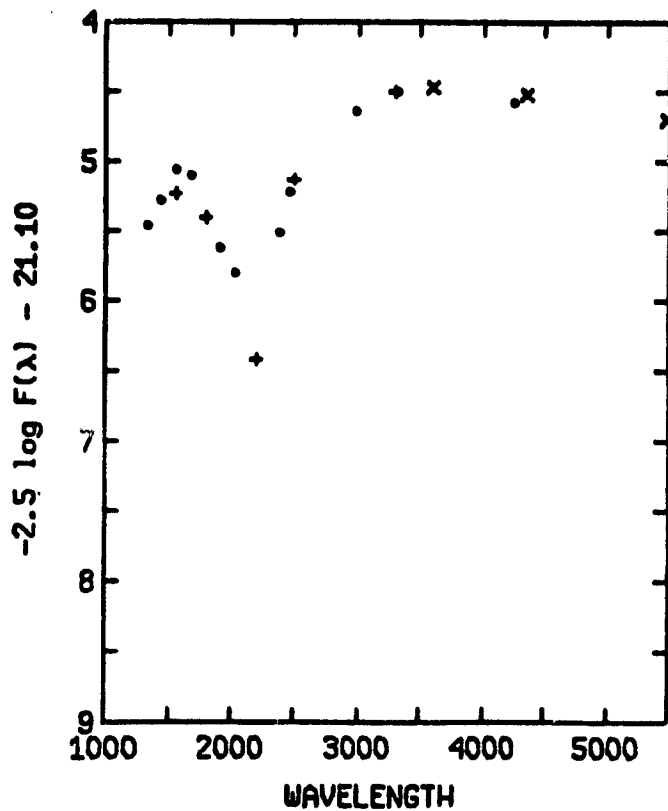
HD 141637 1 SCO B1.5VN



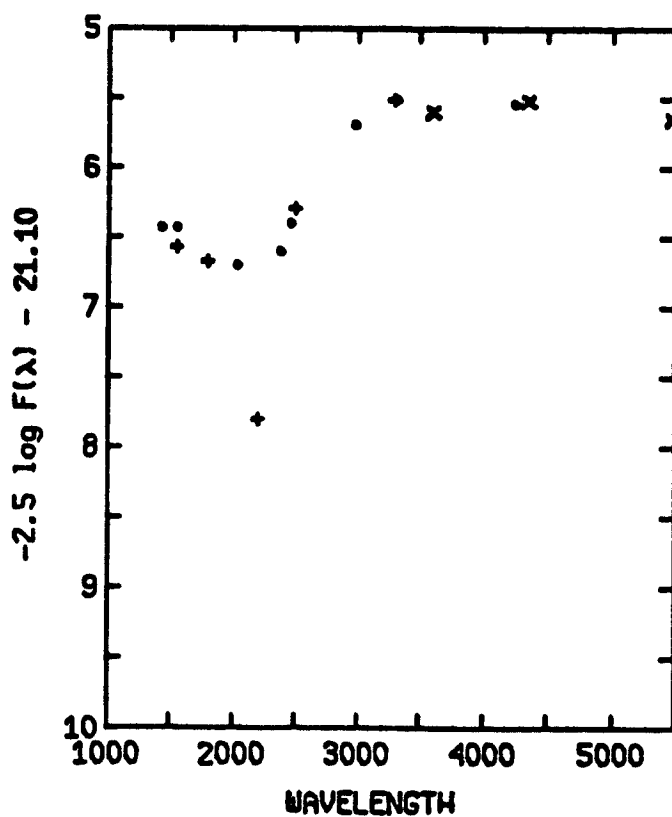
HD 148184 CHI OPH B1.5VE



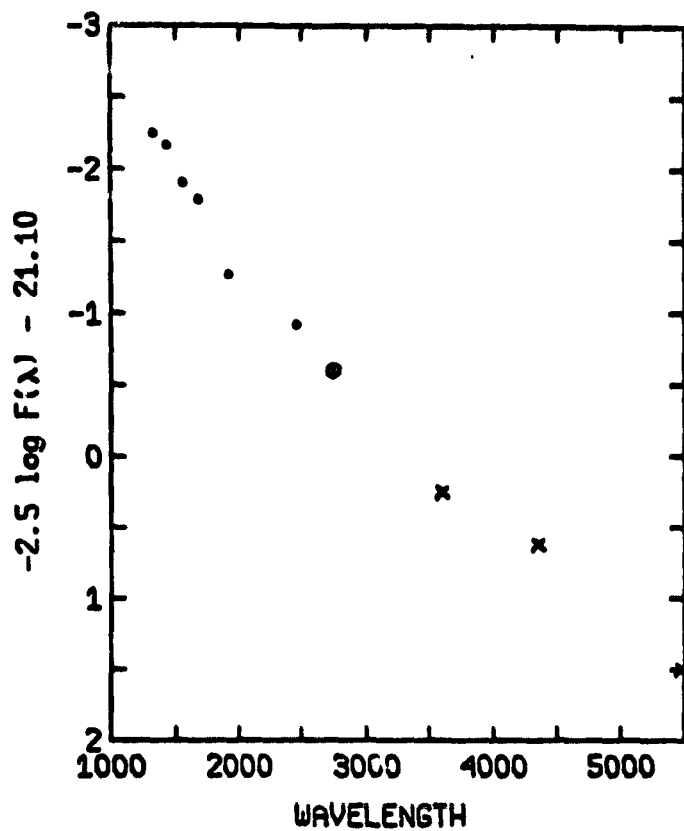
HD 152236 B1.5IA⁺P



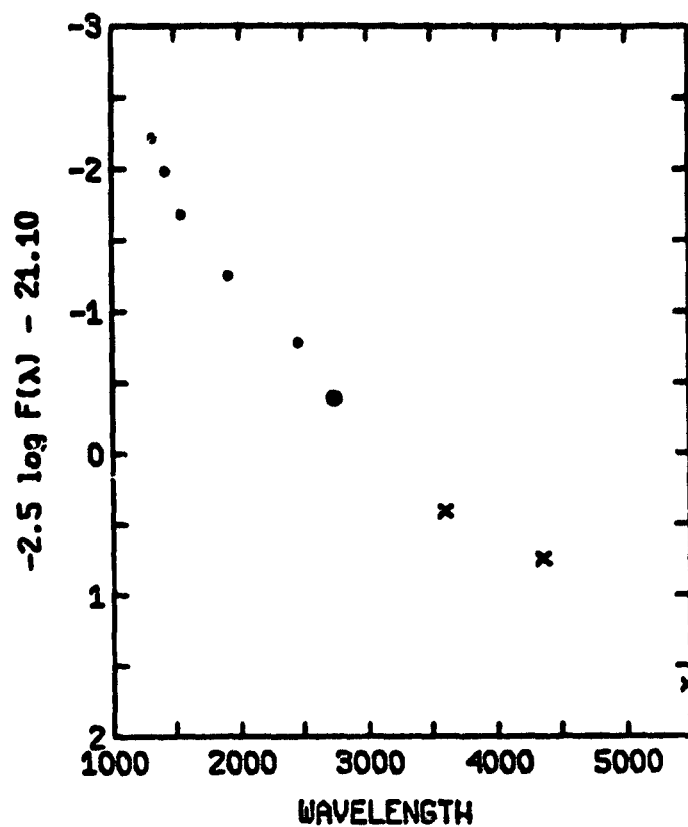
HD 190603 B1.5IA



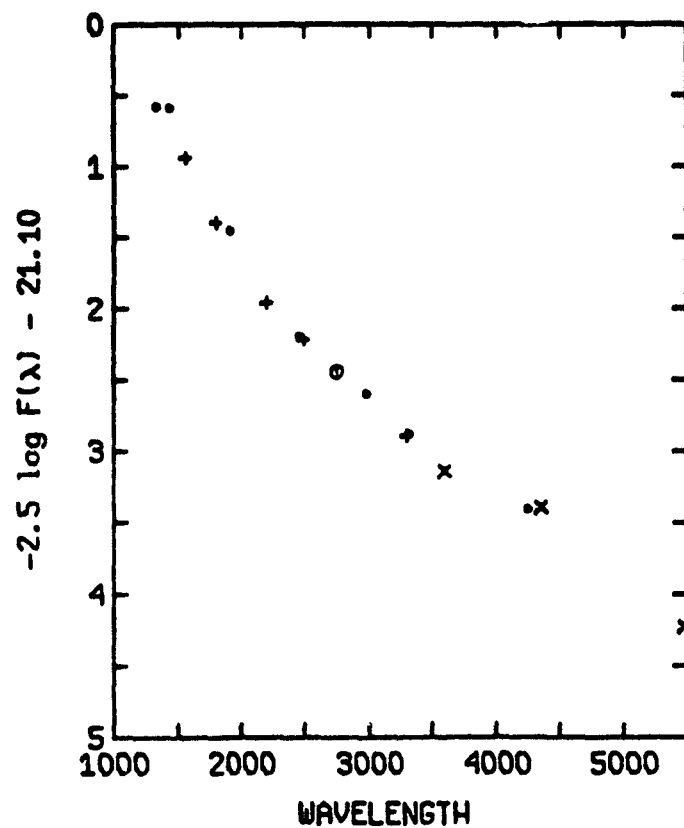
HD 52089 EPS CMA B2 II



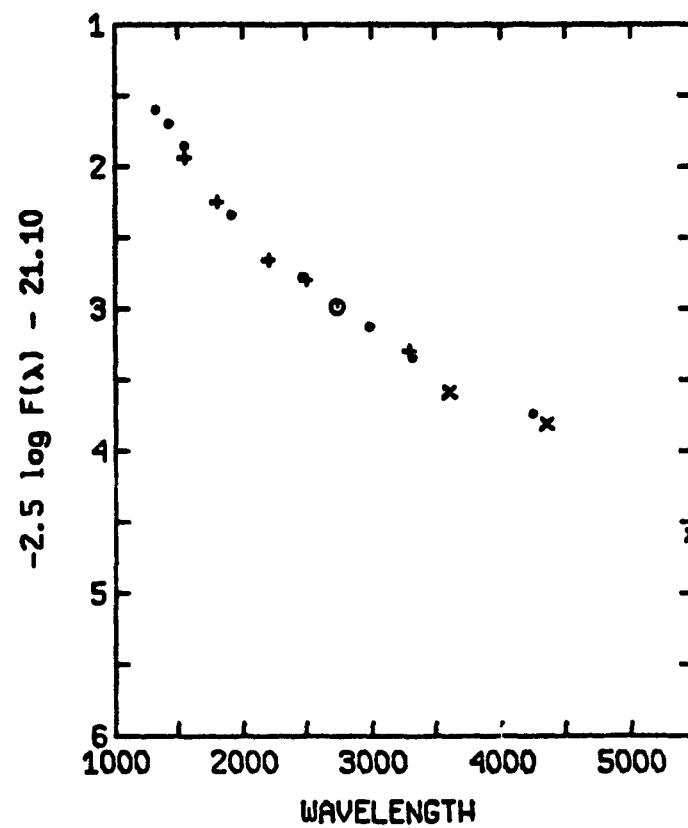
HD 35468 GAM ORI B2 III



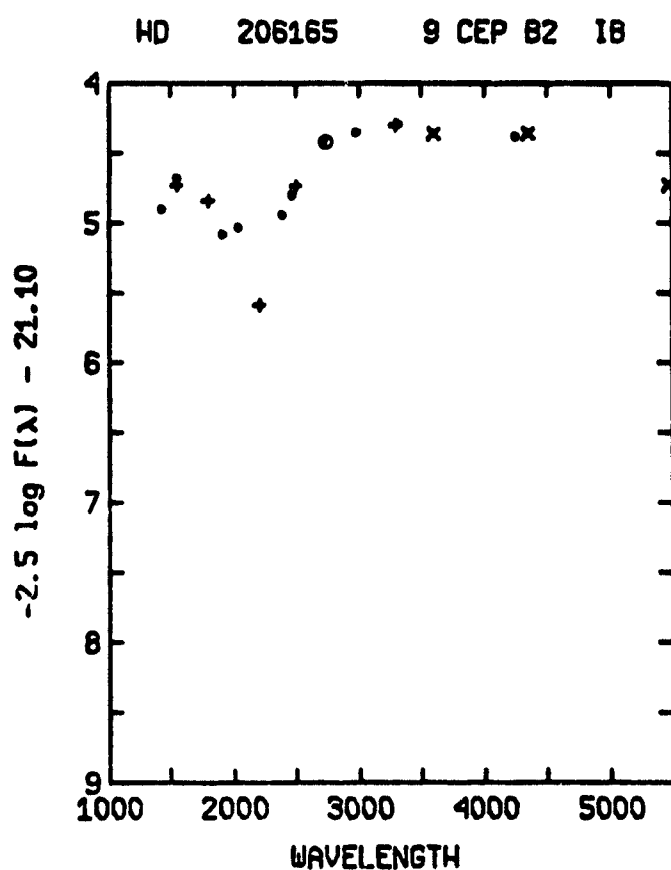
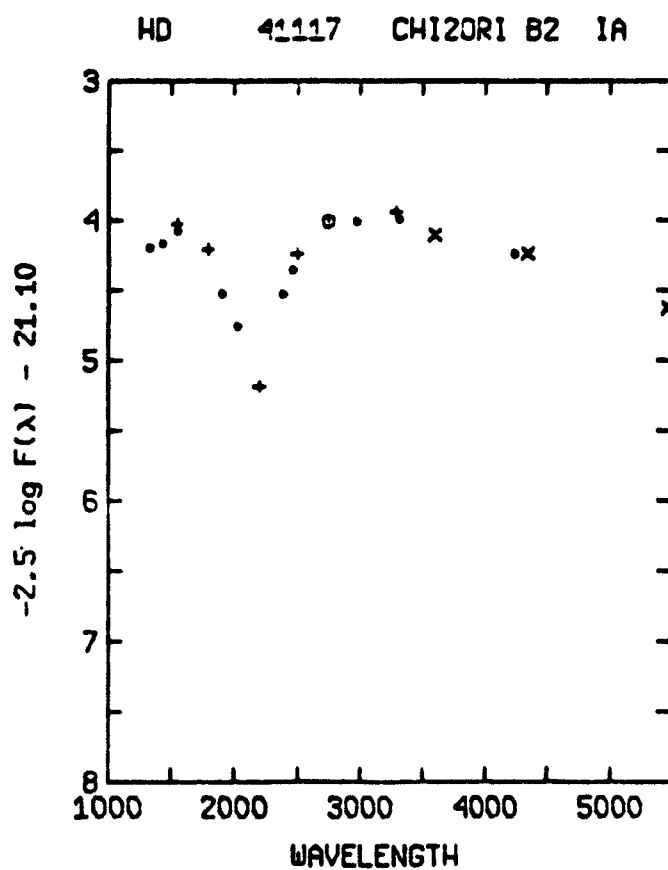
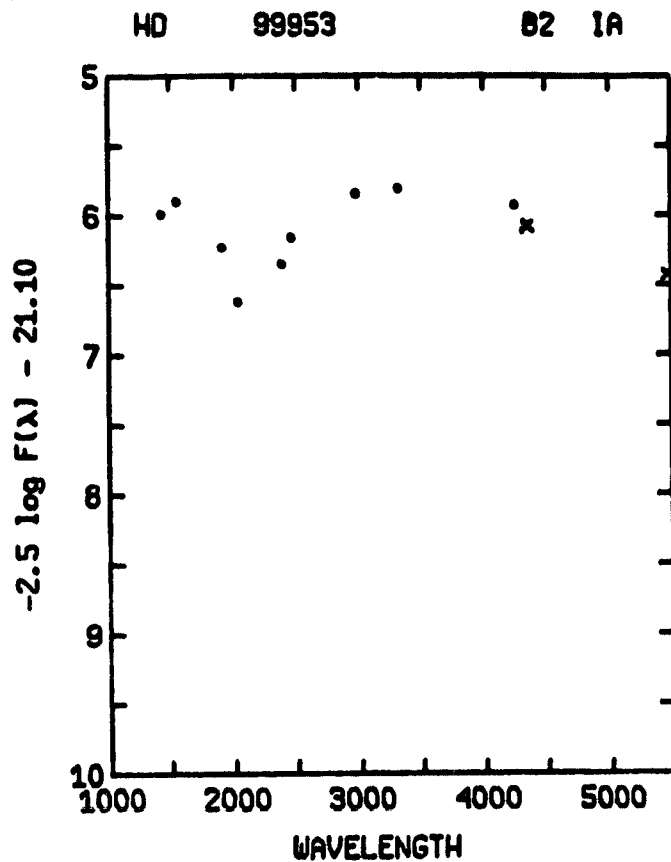
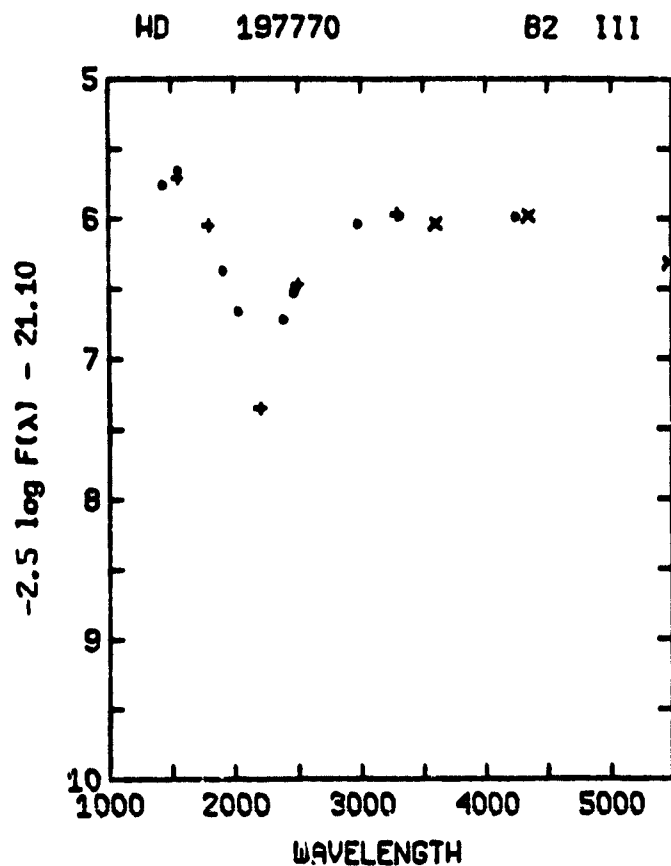
HD 148703 B2 III

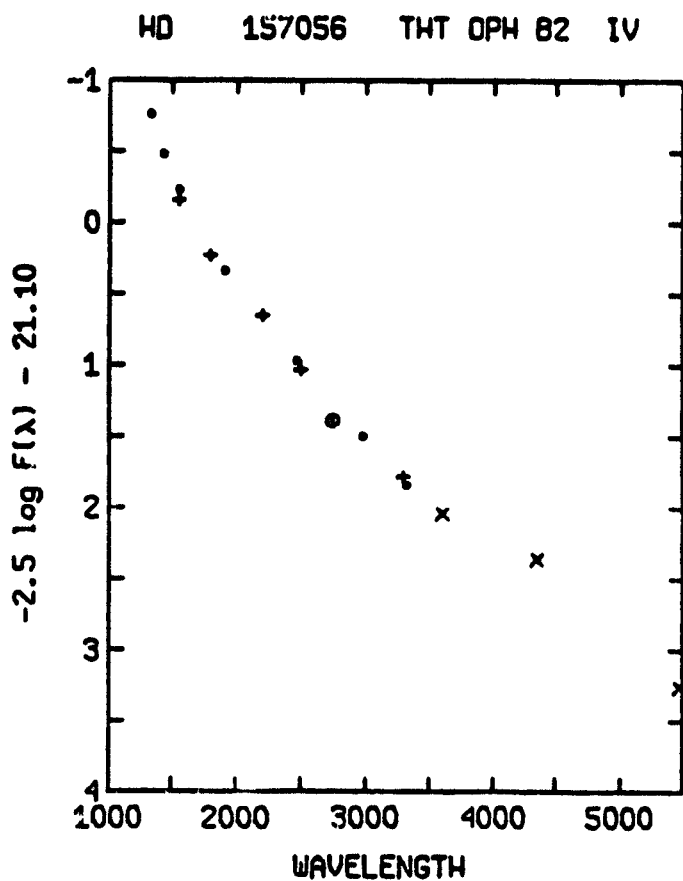
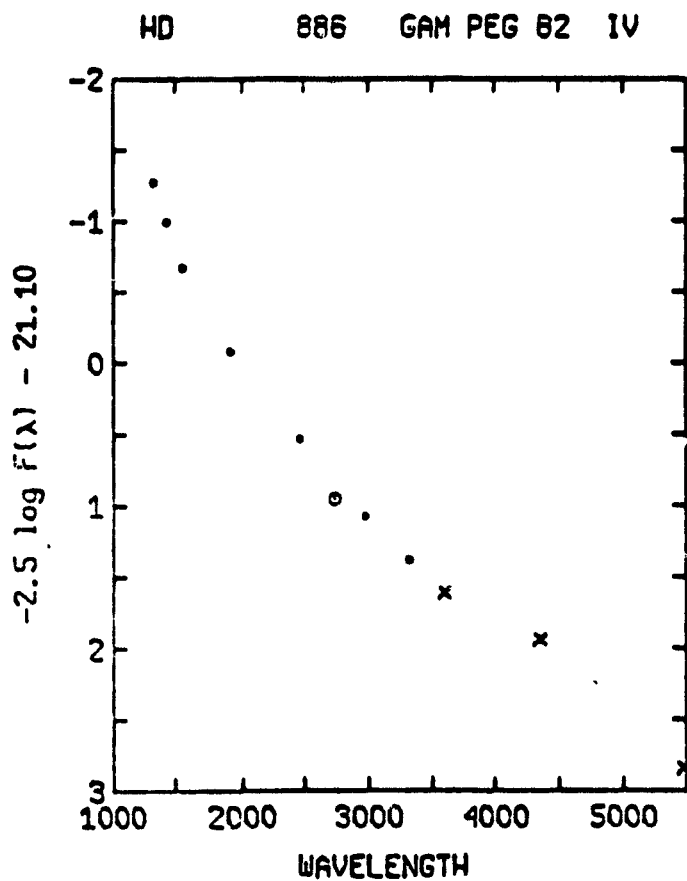
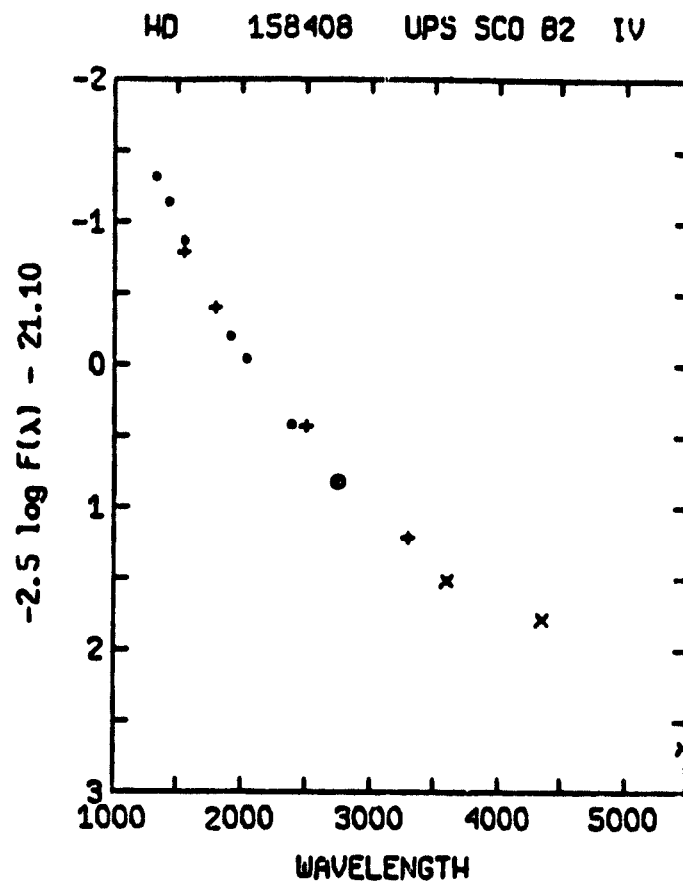
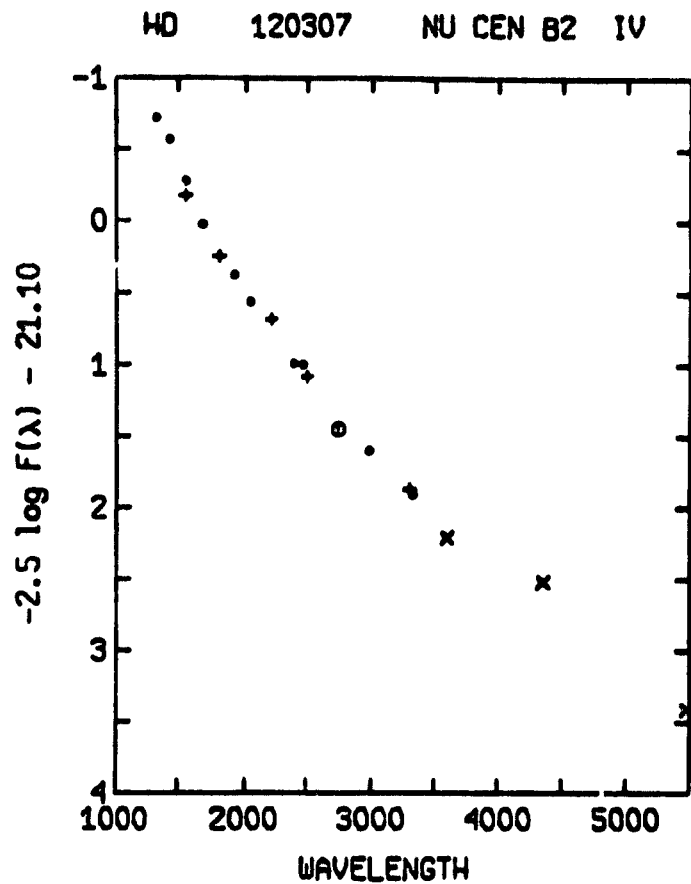


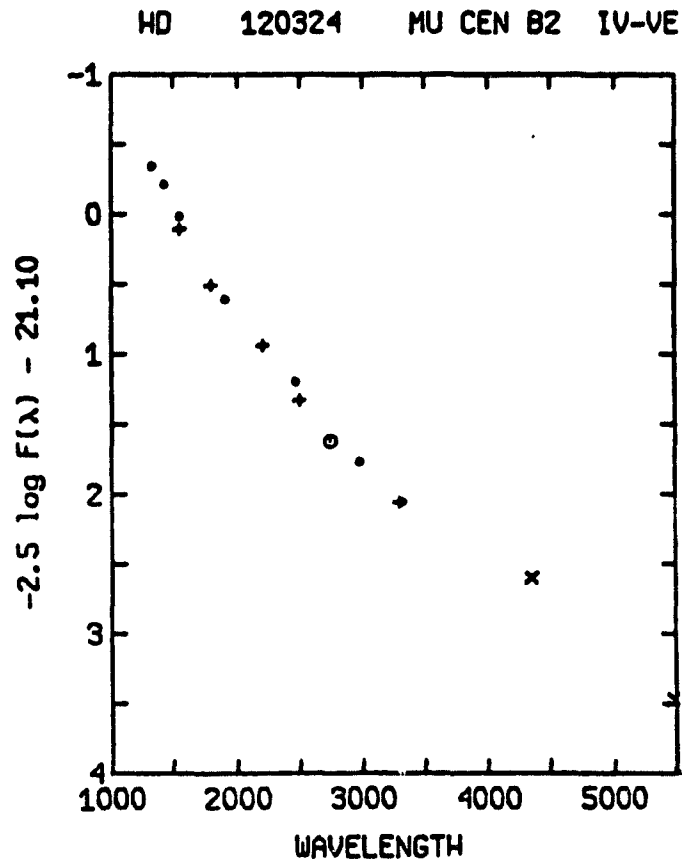
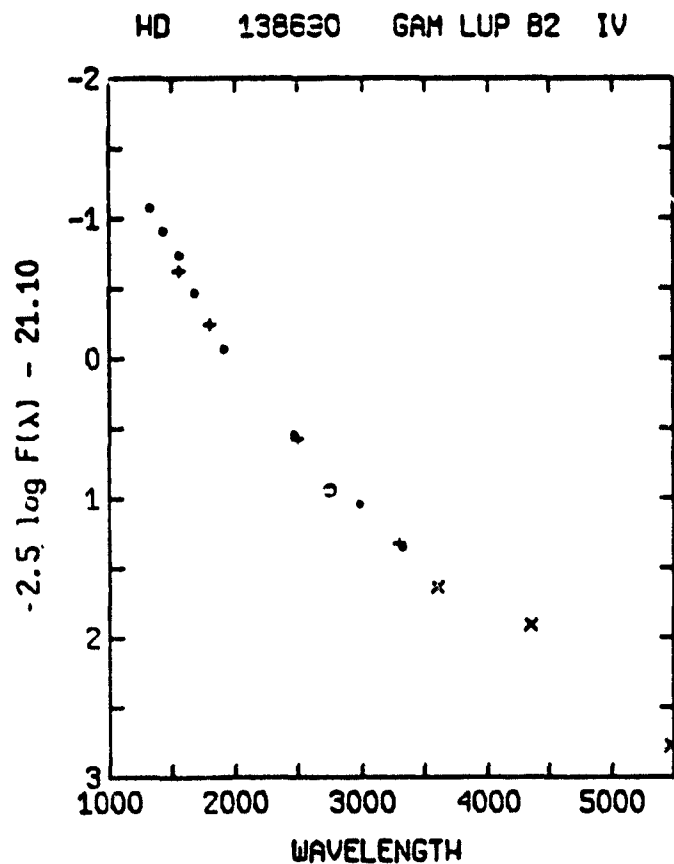
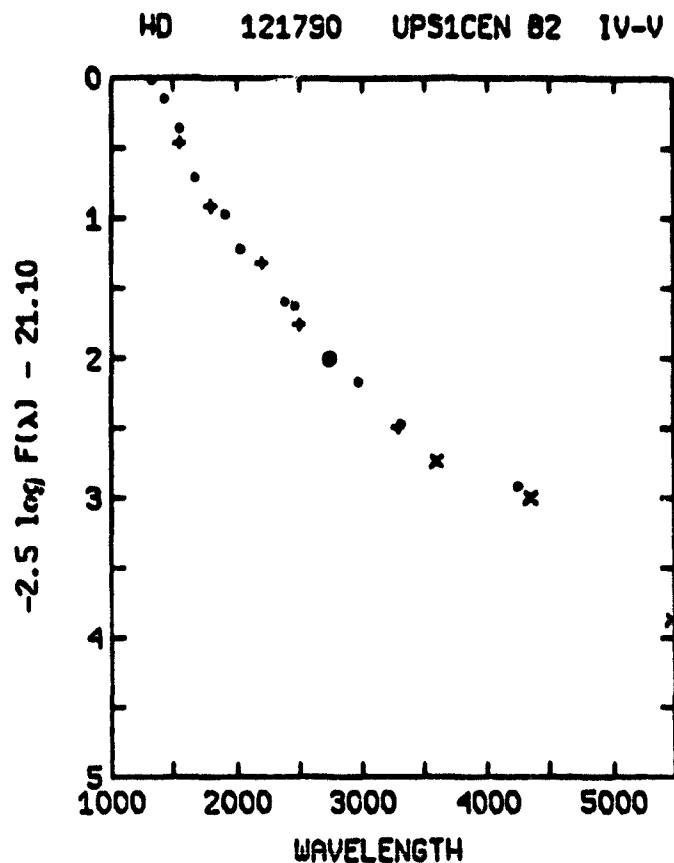
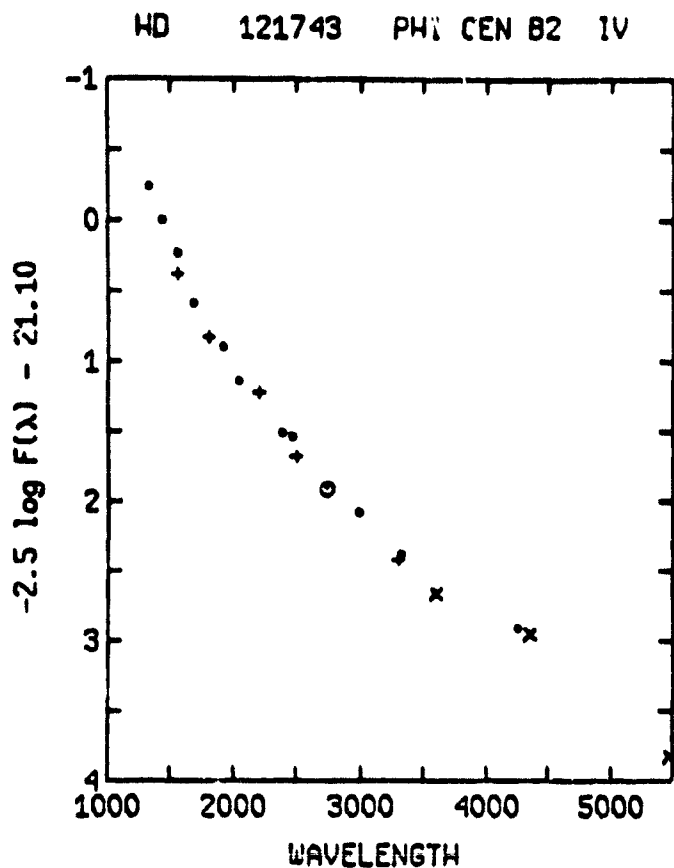
HD 37490 OMG ORI B2 IIIE

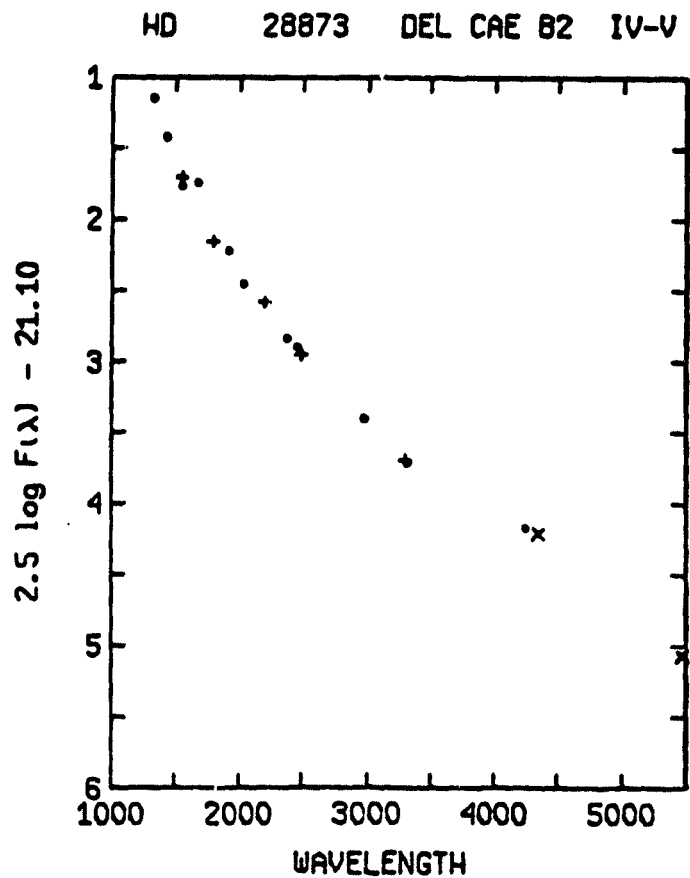
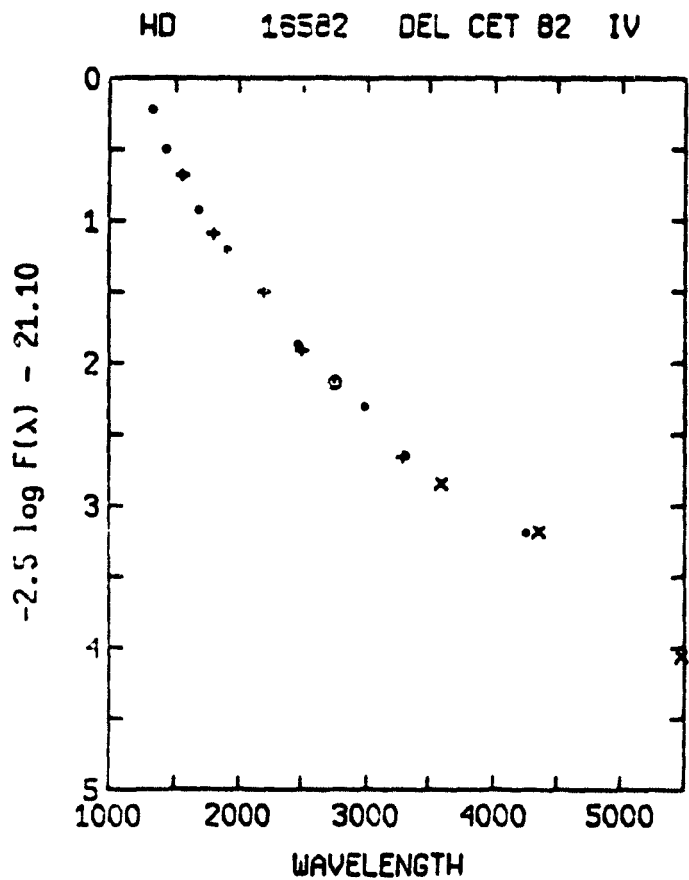
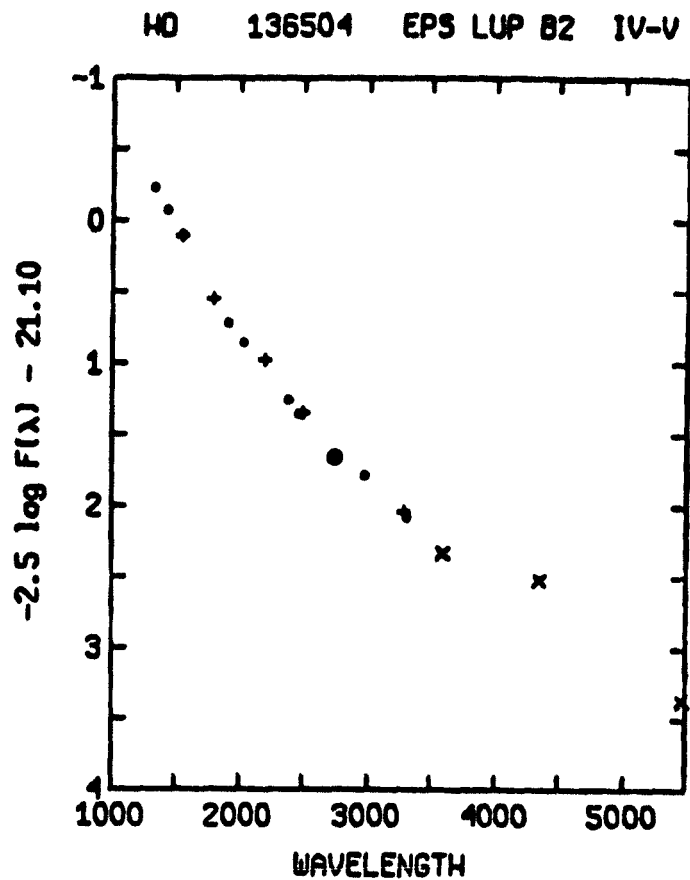
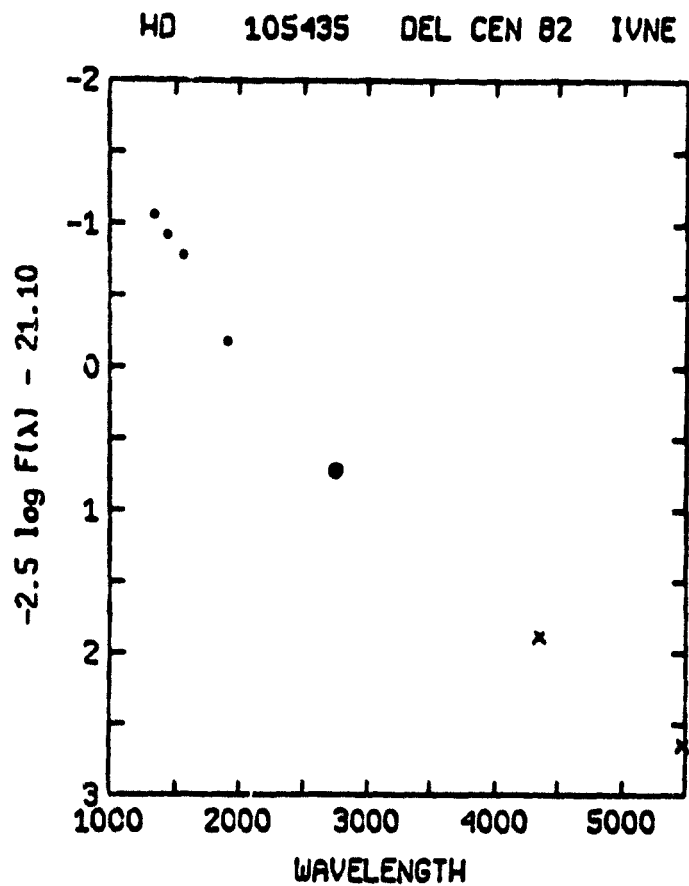


B2 I-III stars
15-18

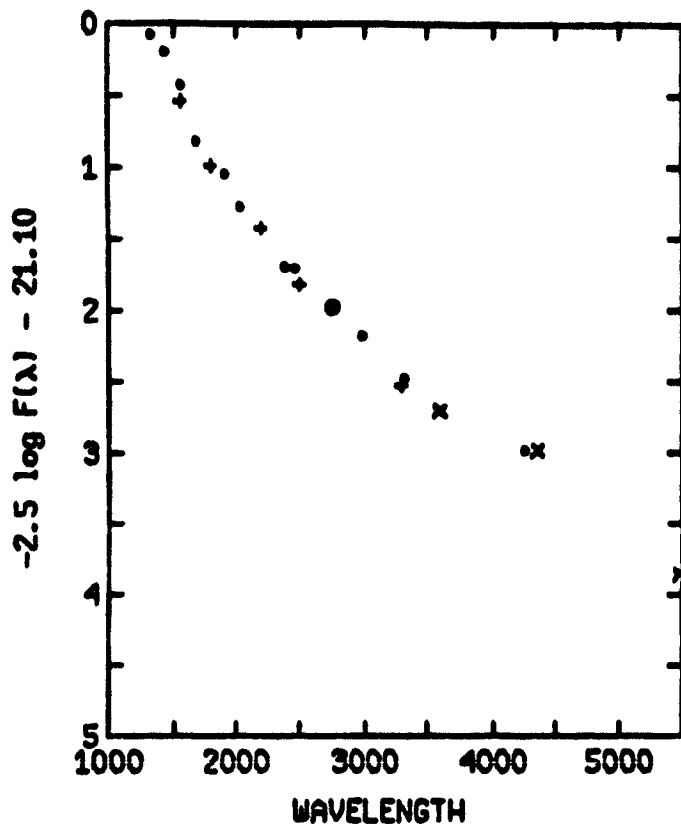




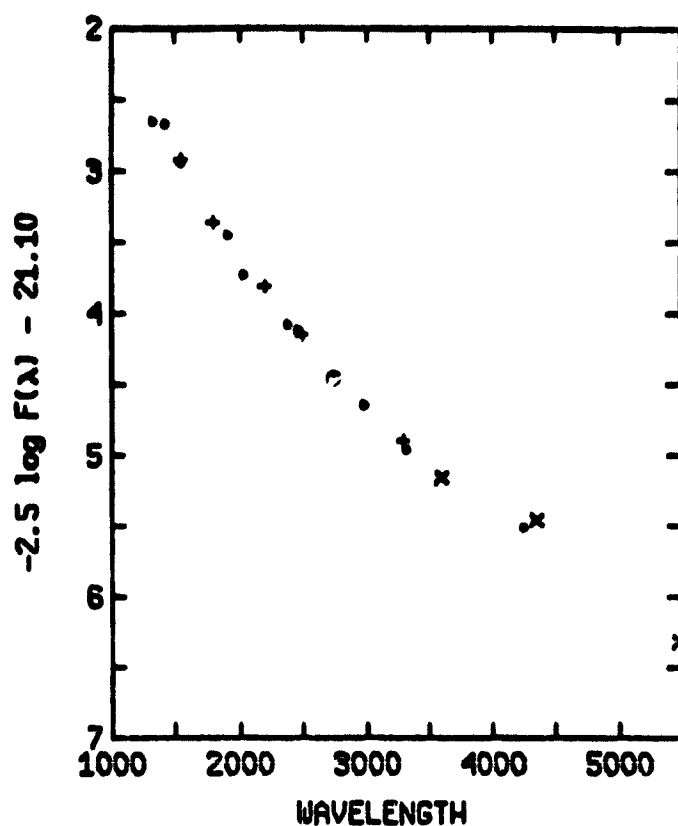




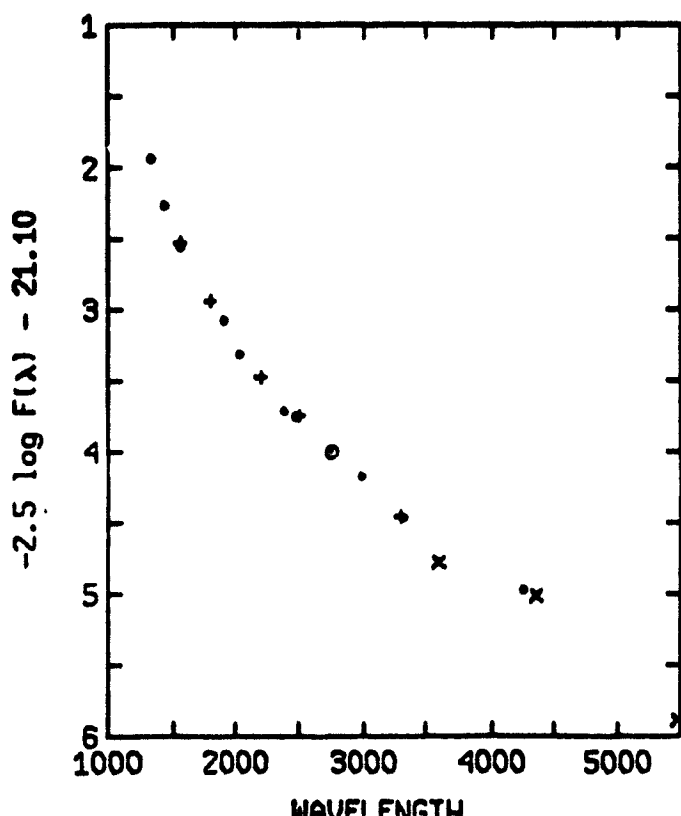
HD 142669 RHO SCO B2 IV-V



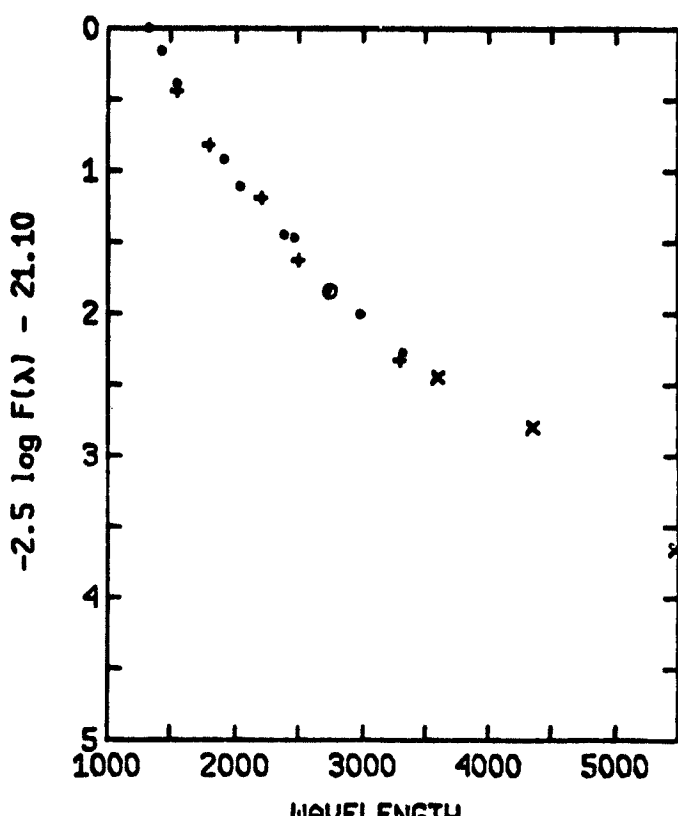
HD 36285 B2 IV-V

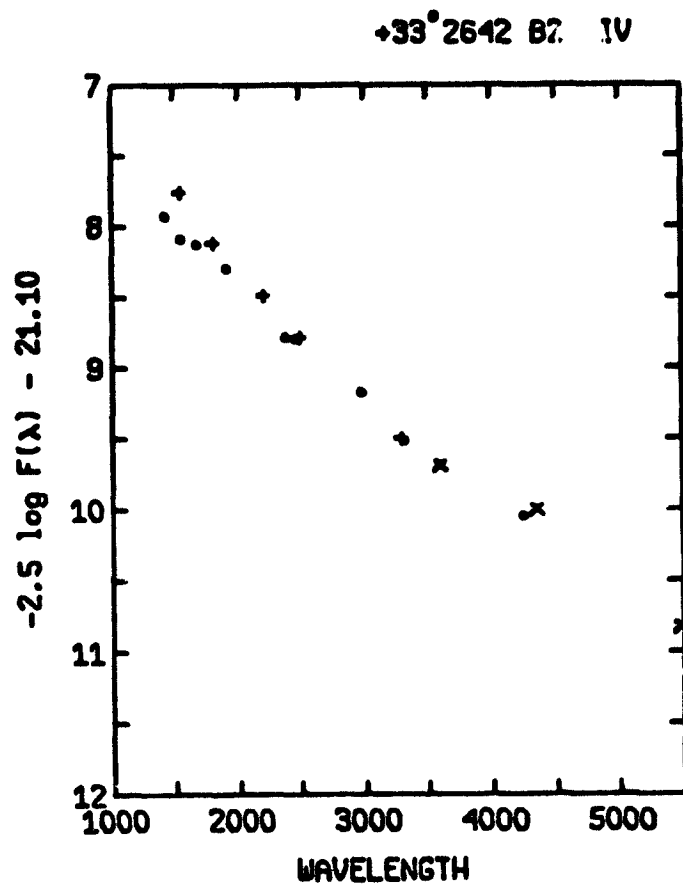
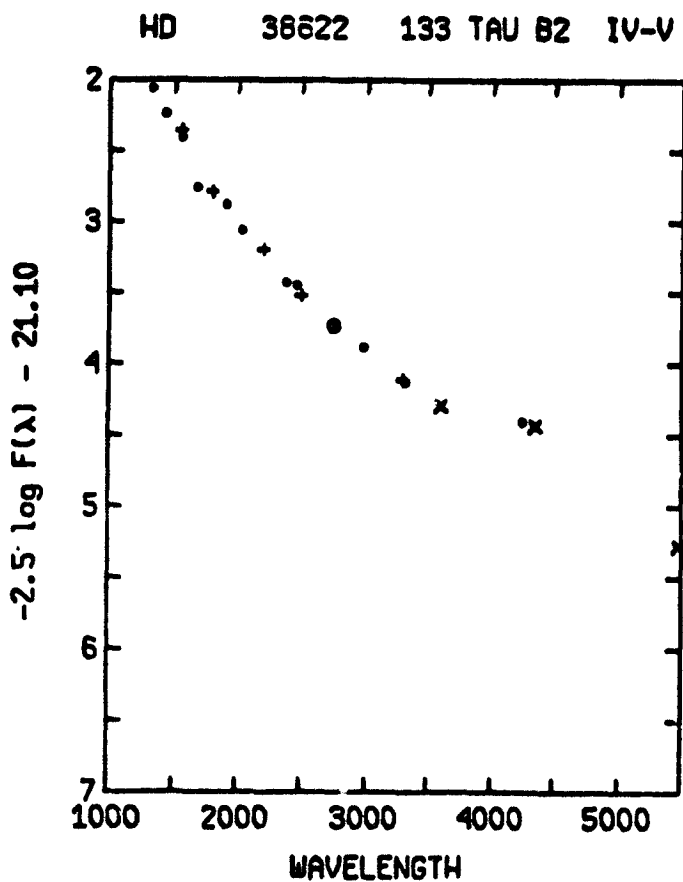
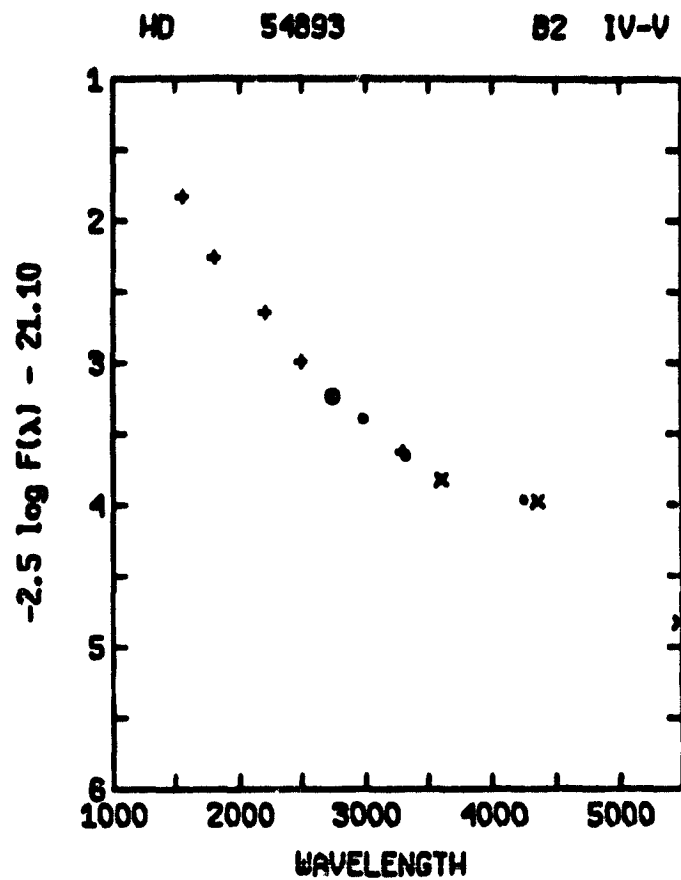
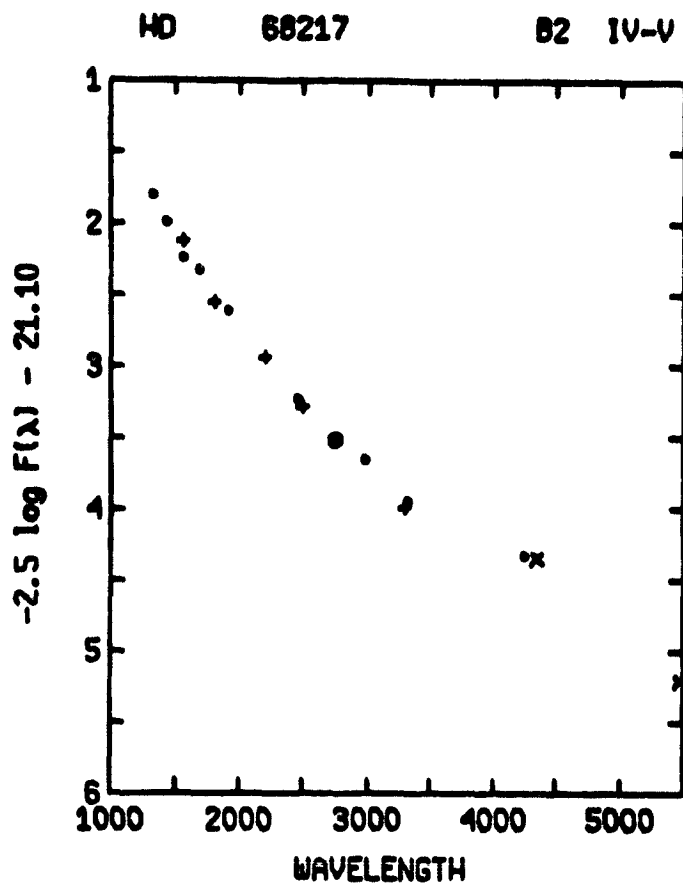


HD 63271 B2 IV-V



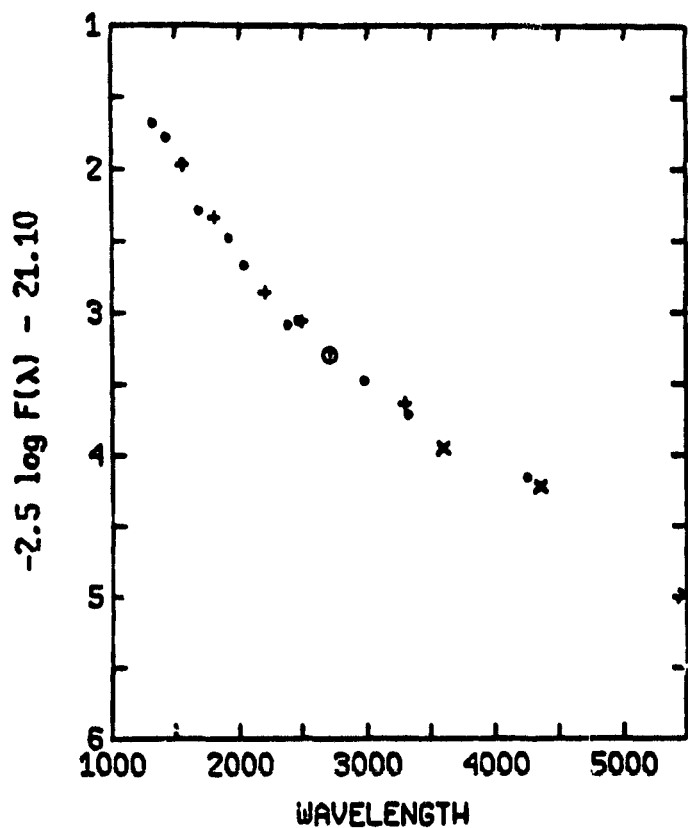
HD 3360 ZET CAS B2 IV



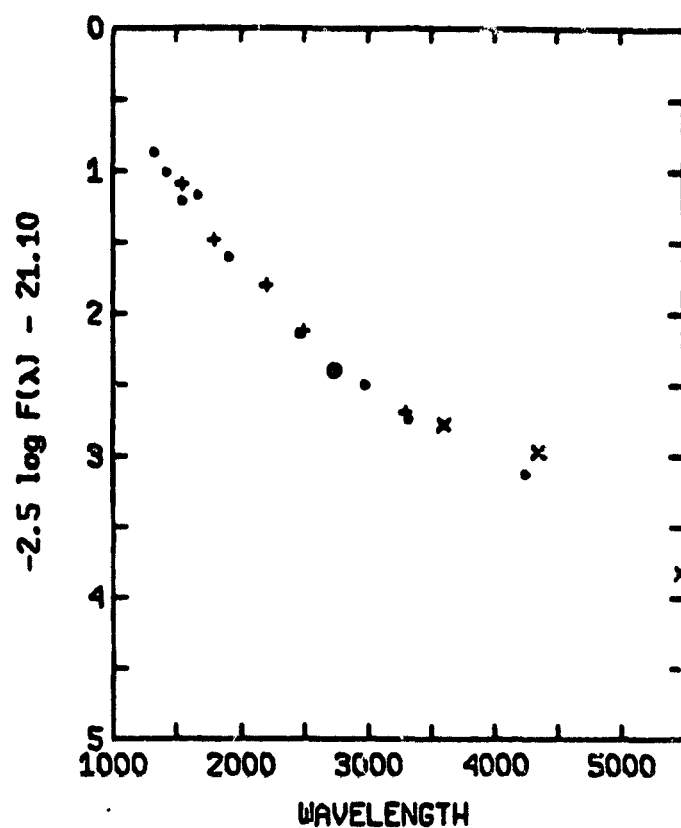


B2 IV-(IV-V) stars
J21-J23

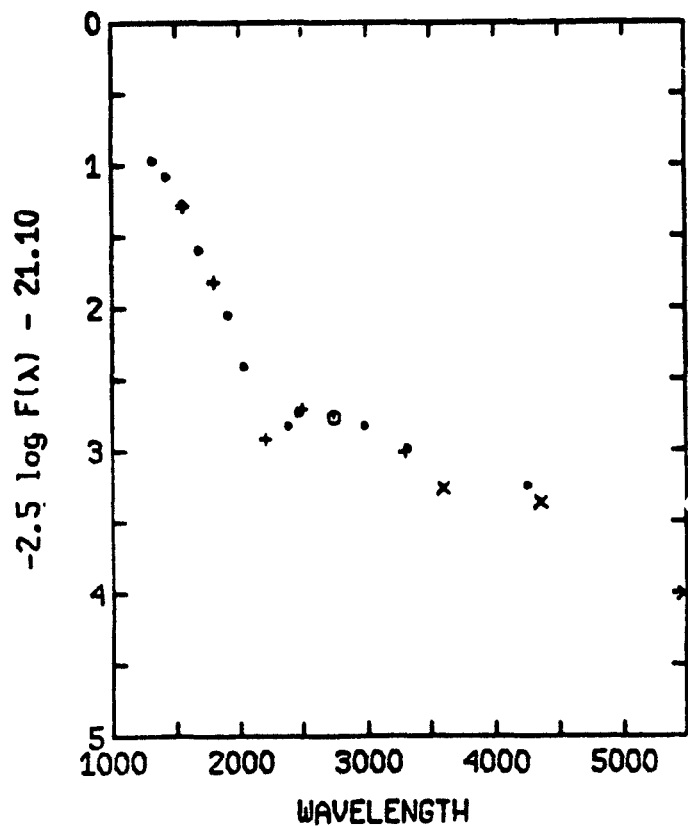
HD 212076 31 PEG B2 IV-V

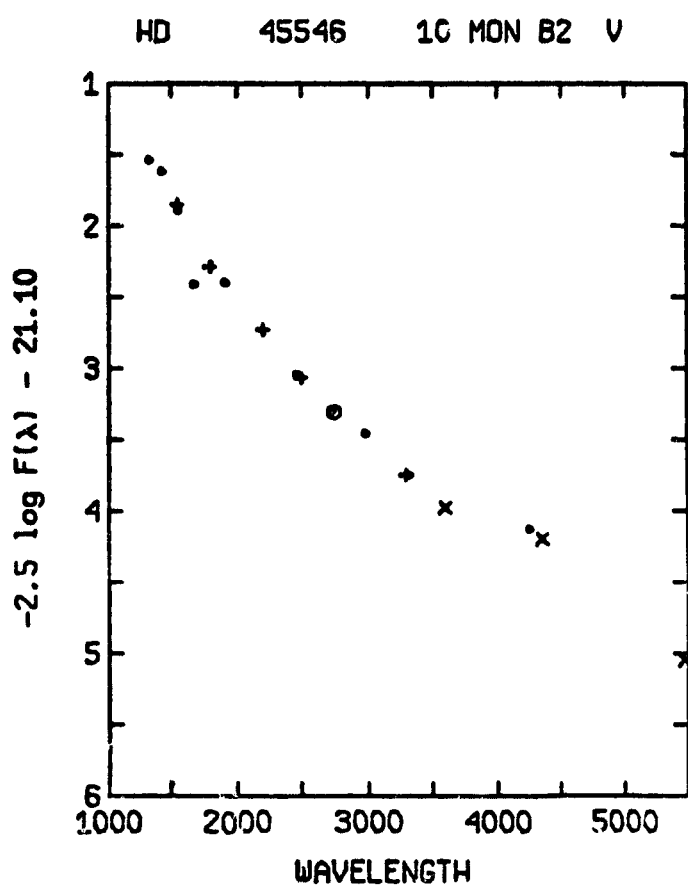
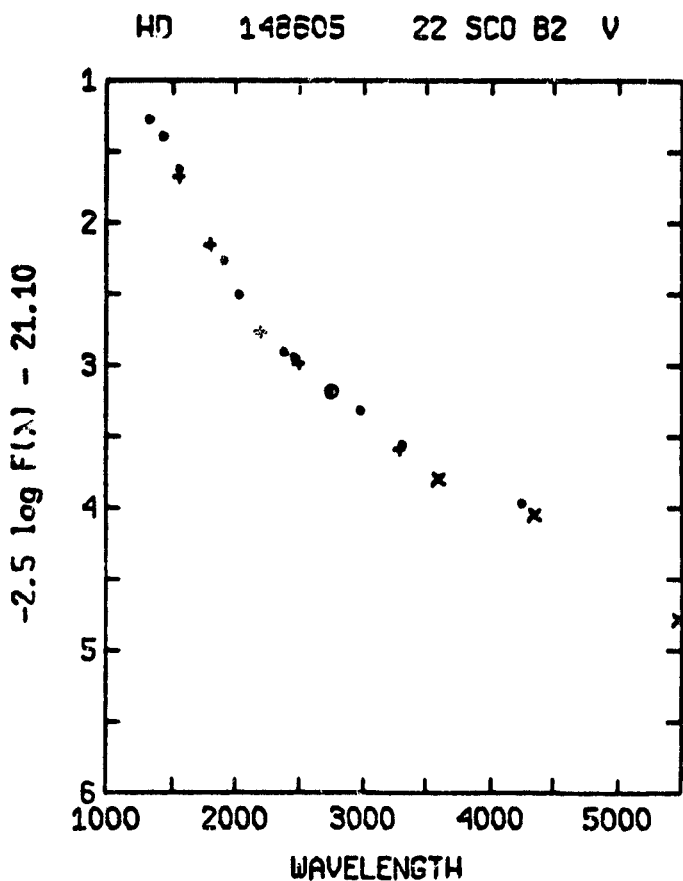
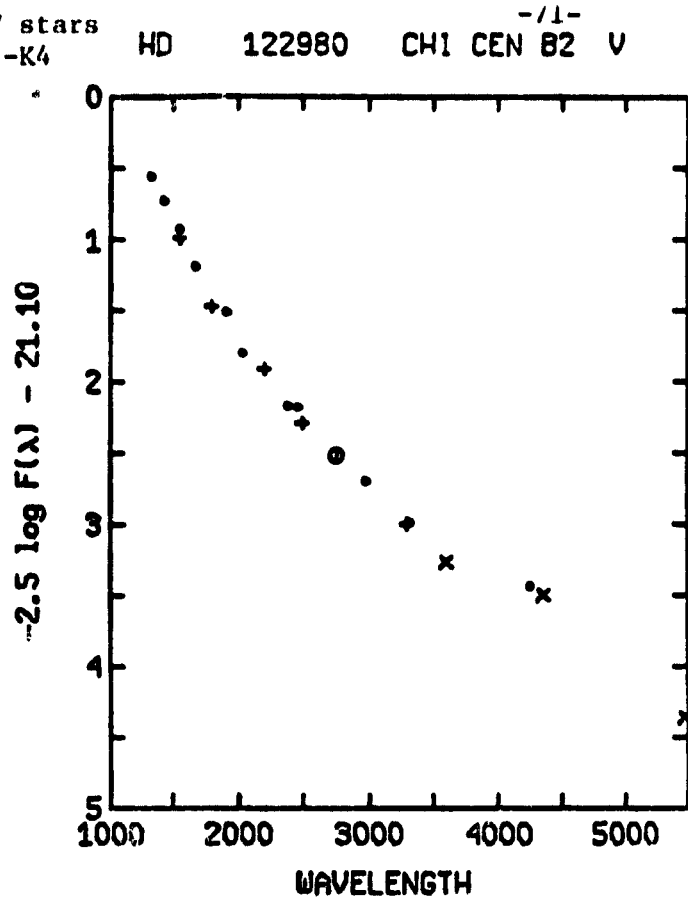
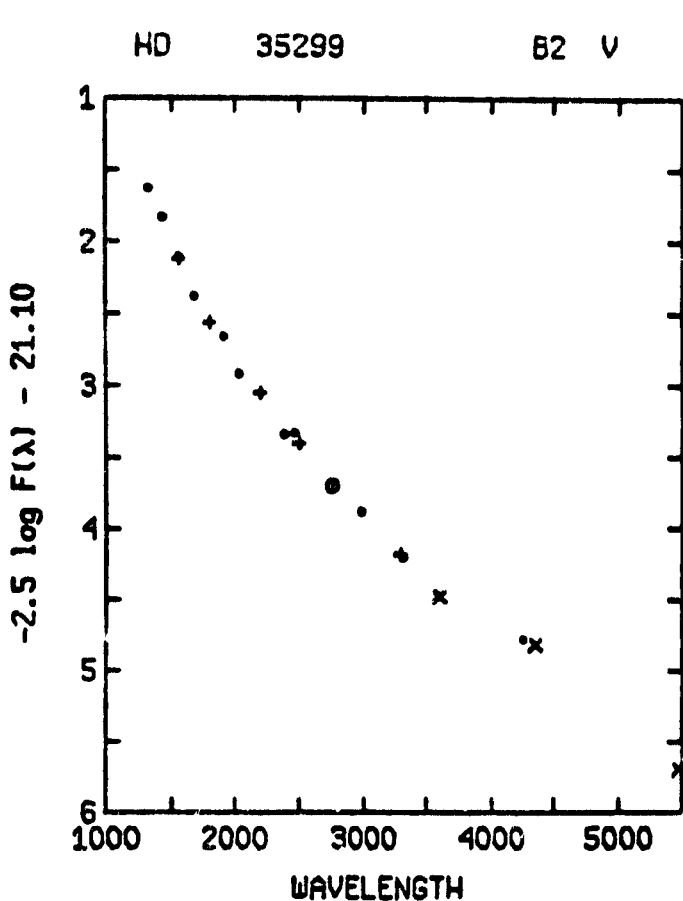


HD 56139 DMG CMA B2 IV-VE

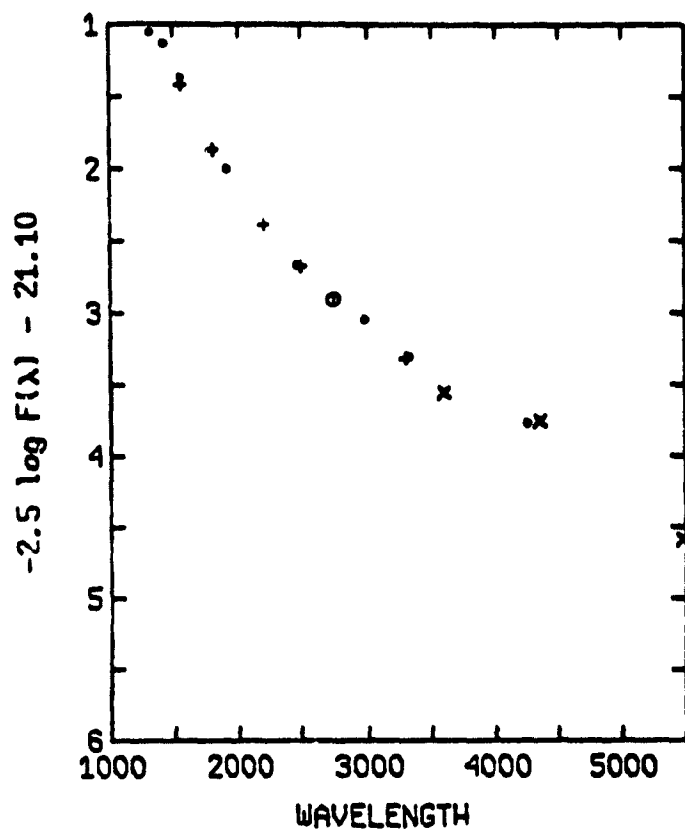


HD 145501/2 NU SCO B2 IVP

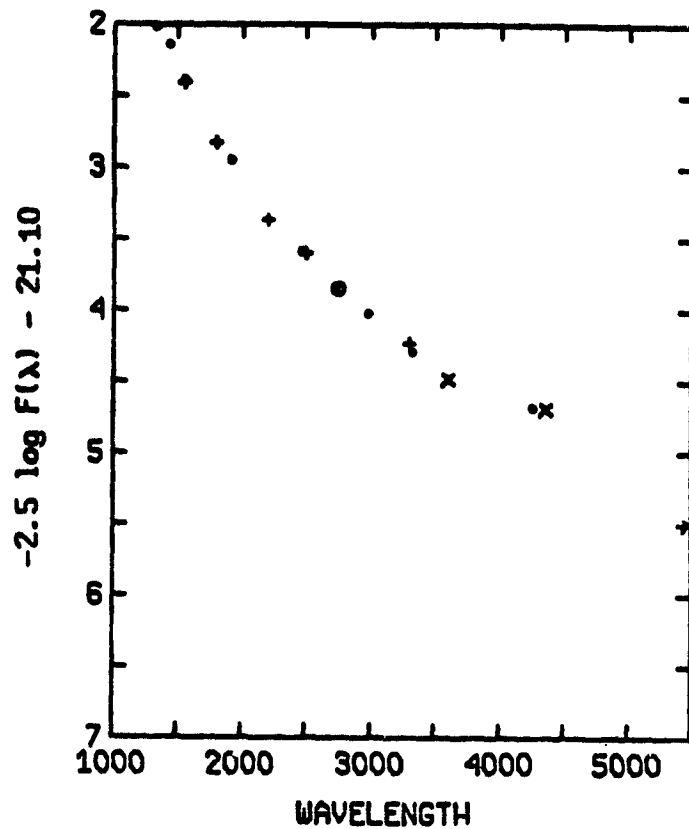




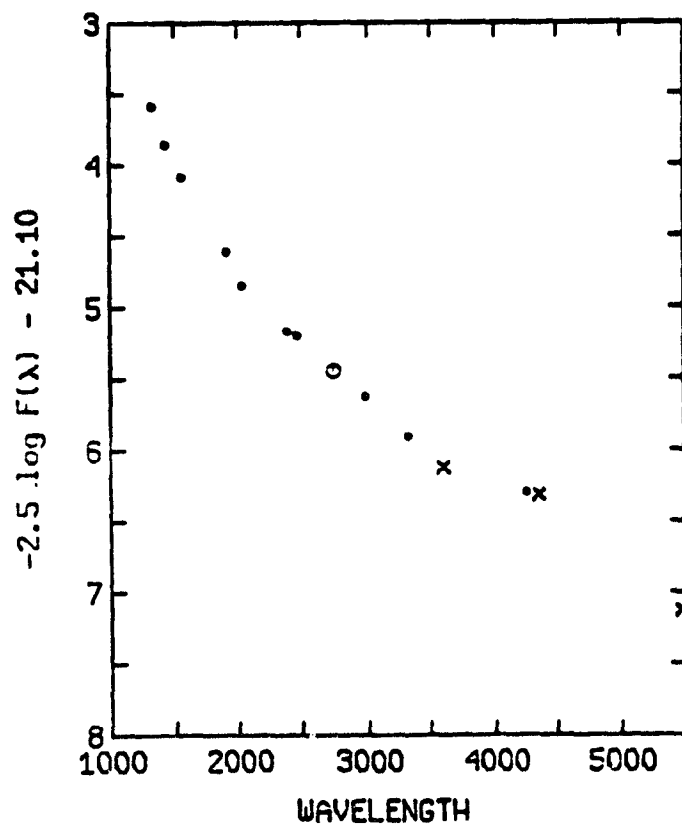
HD 145482 13 SCO B2 V



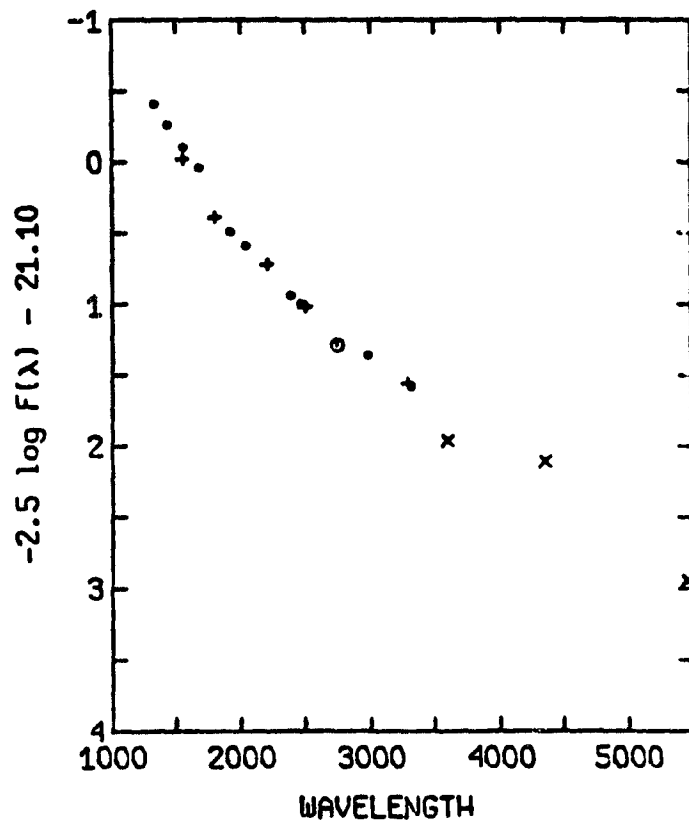
HD 138485 ZET LIB B2 VN

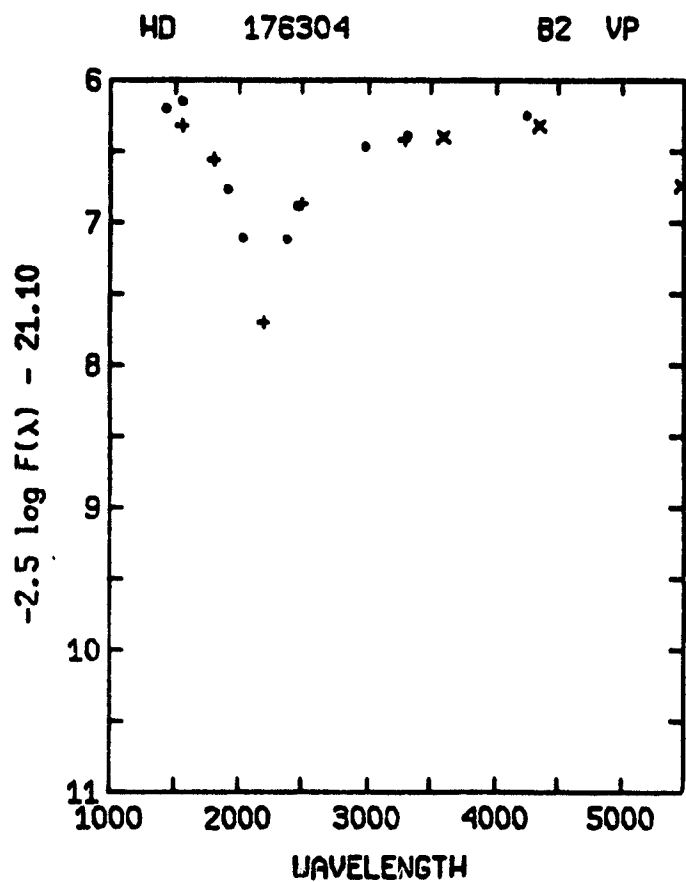
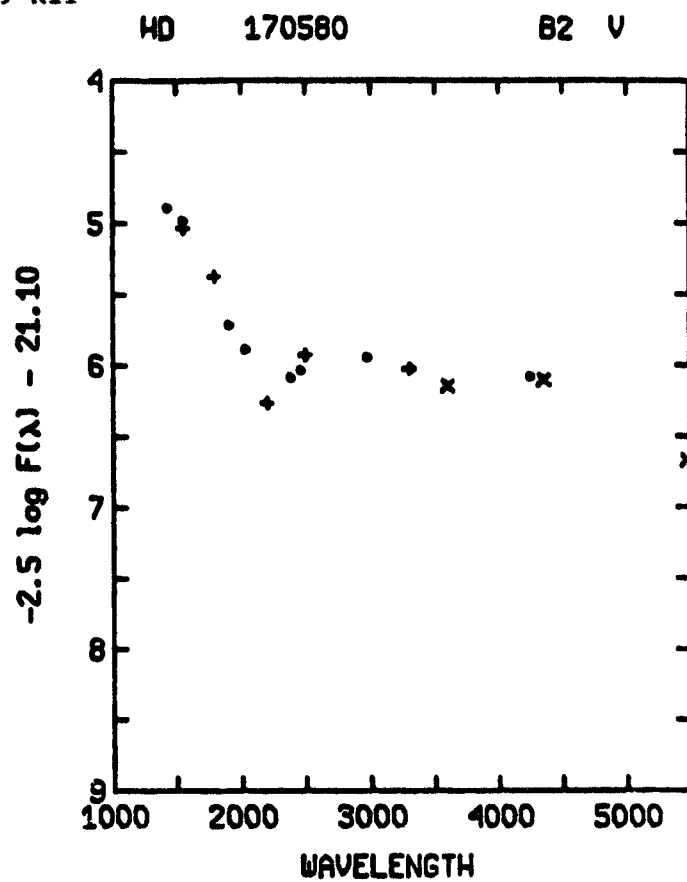
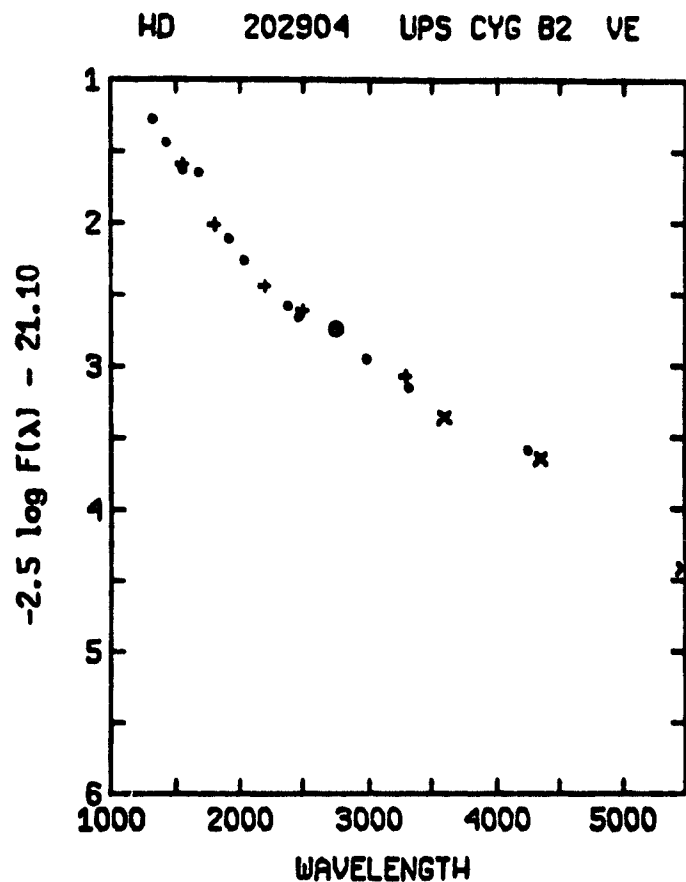


HD 37129 B2 VP

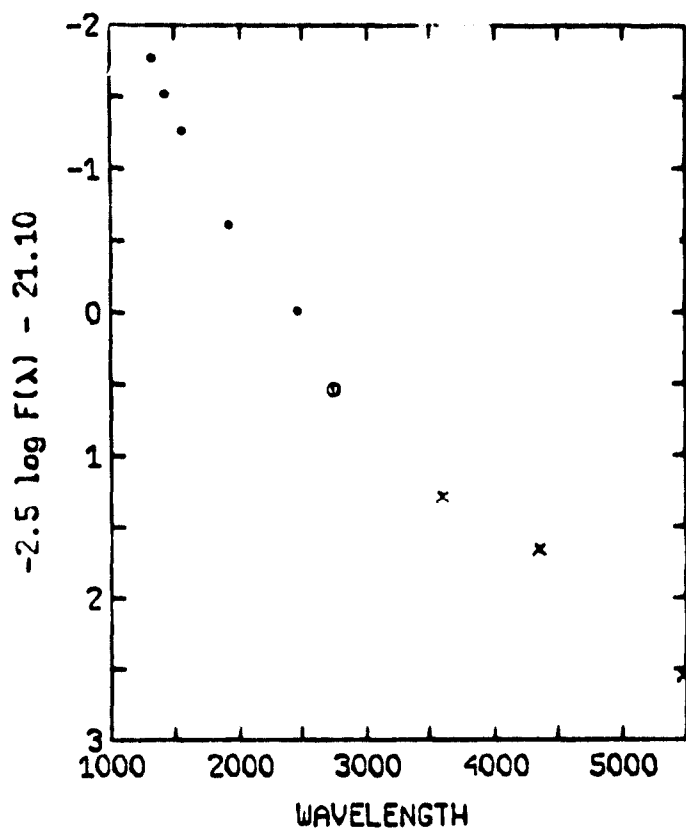


HD 158427 ALF ARA B2 VNE

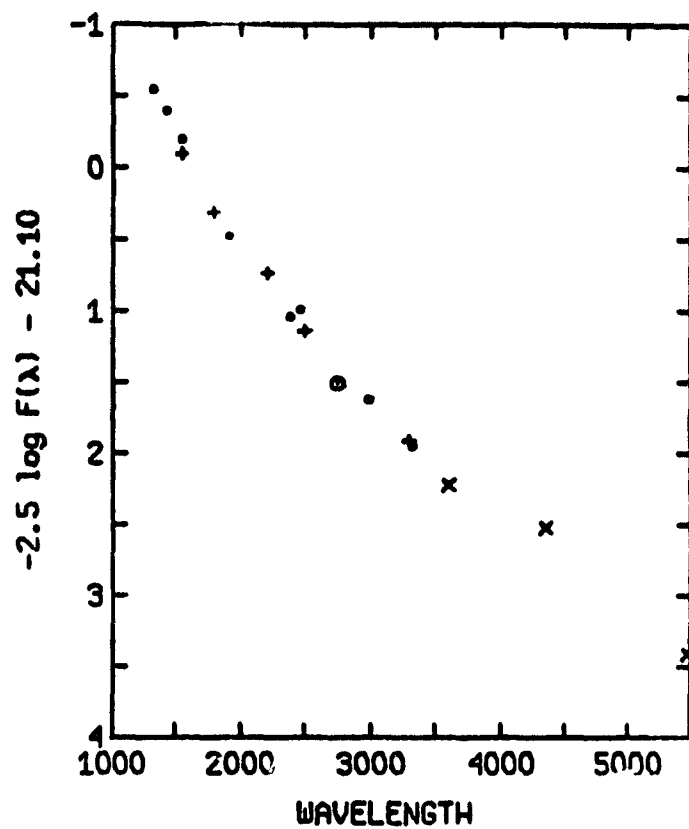




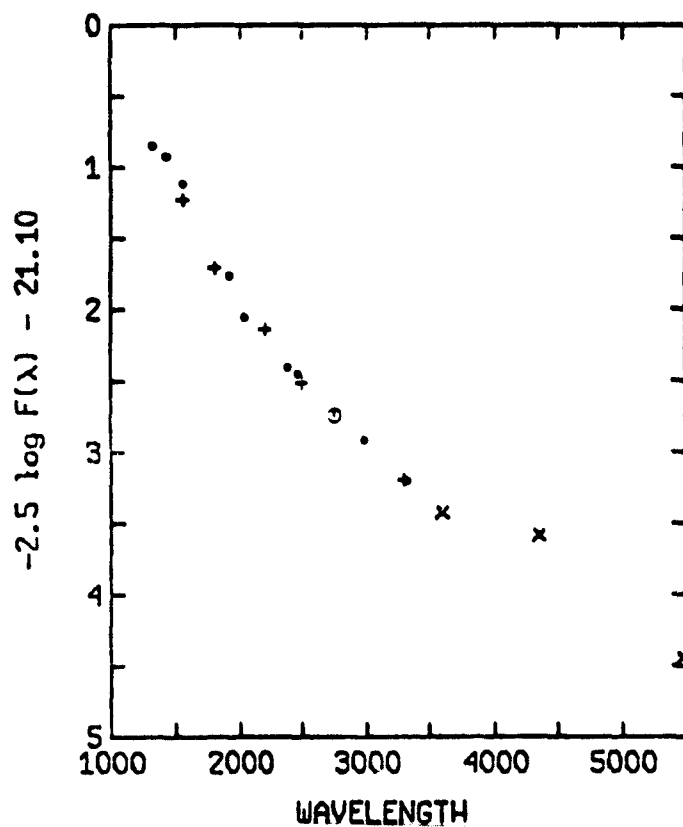
HD 121263 ZET LEO B2.5IV



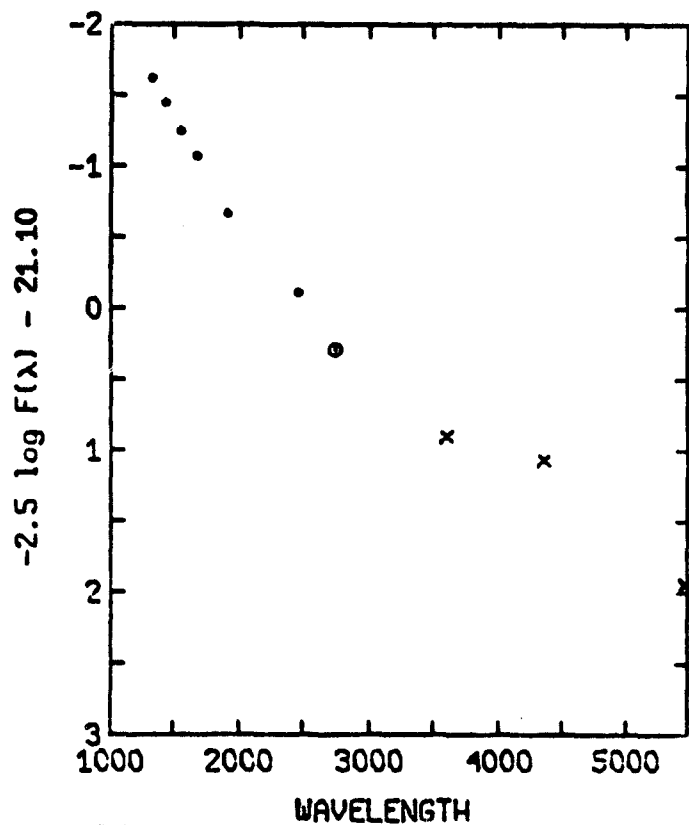
HD 143118 ETA LUP B2.5IV

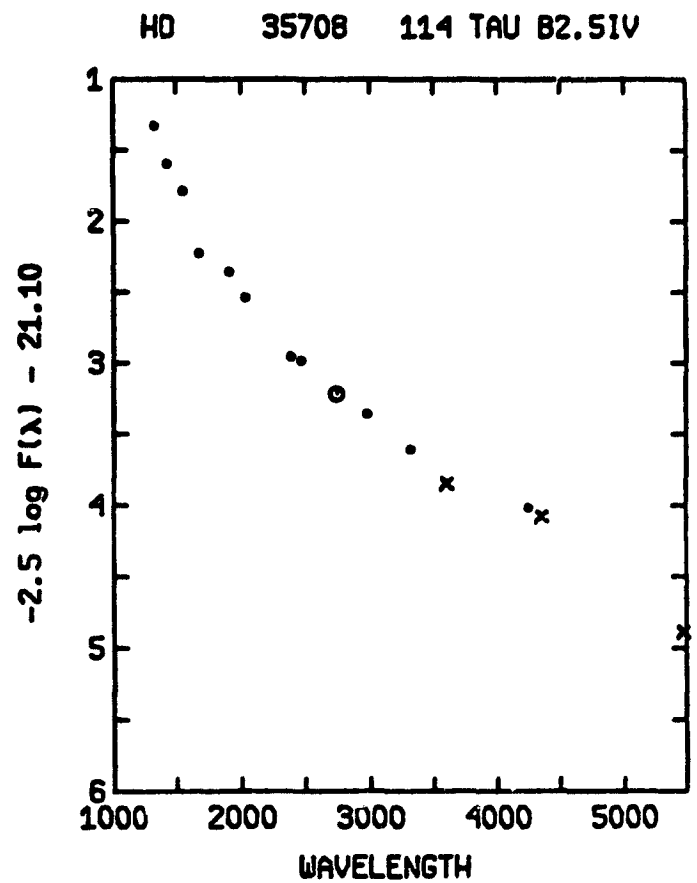
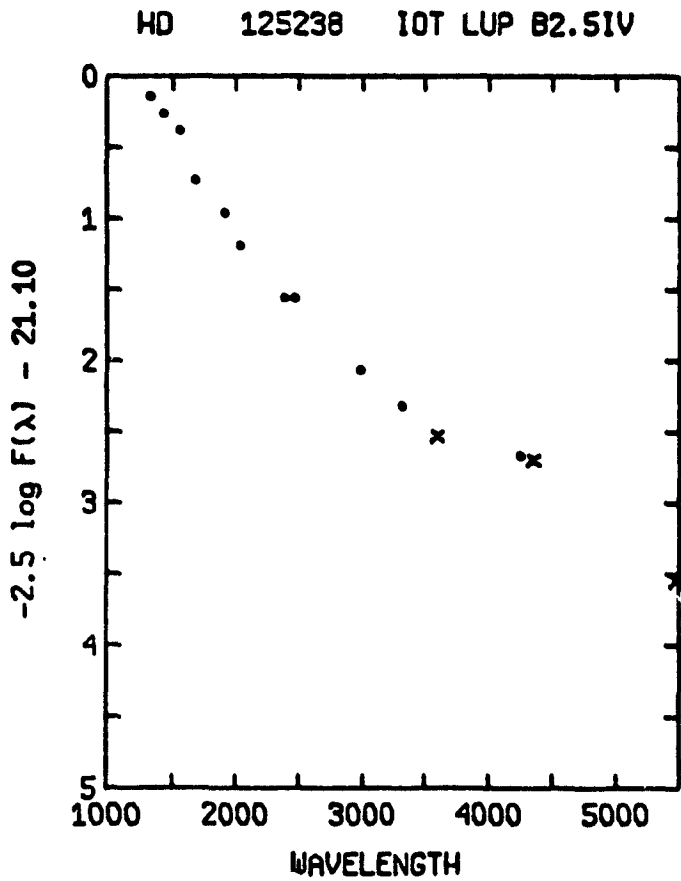
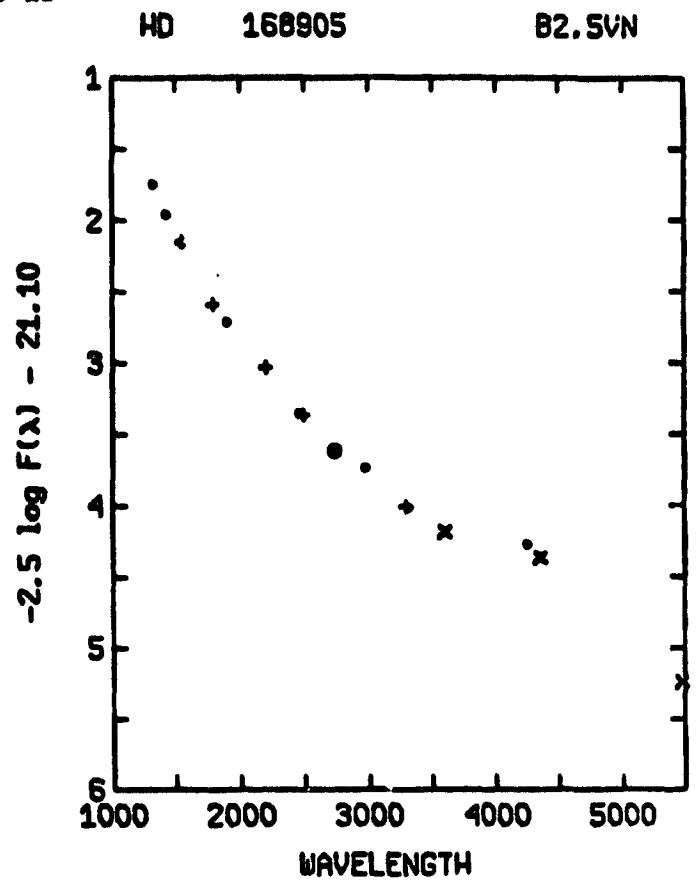
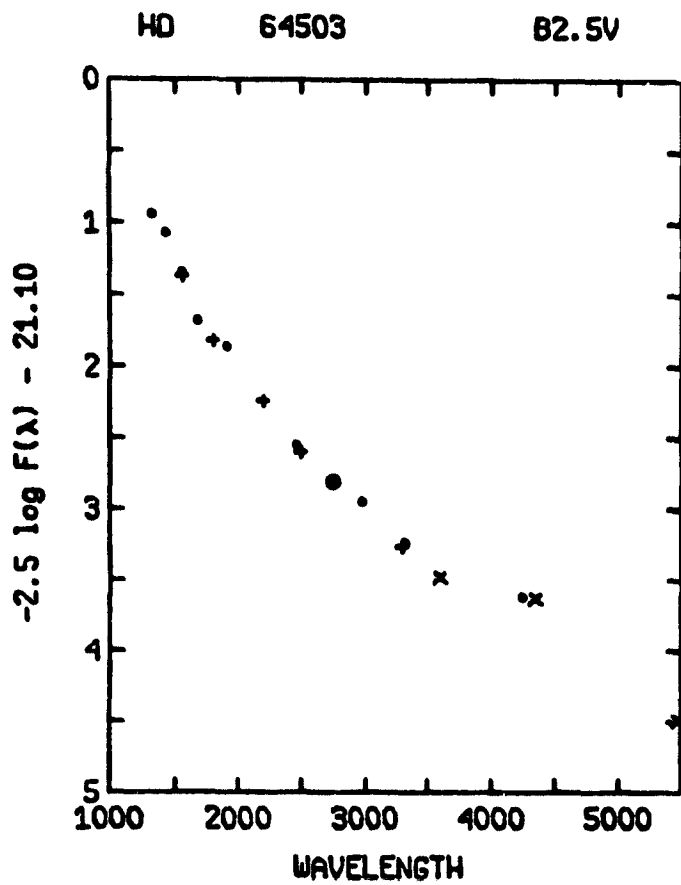


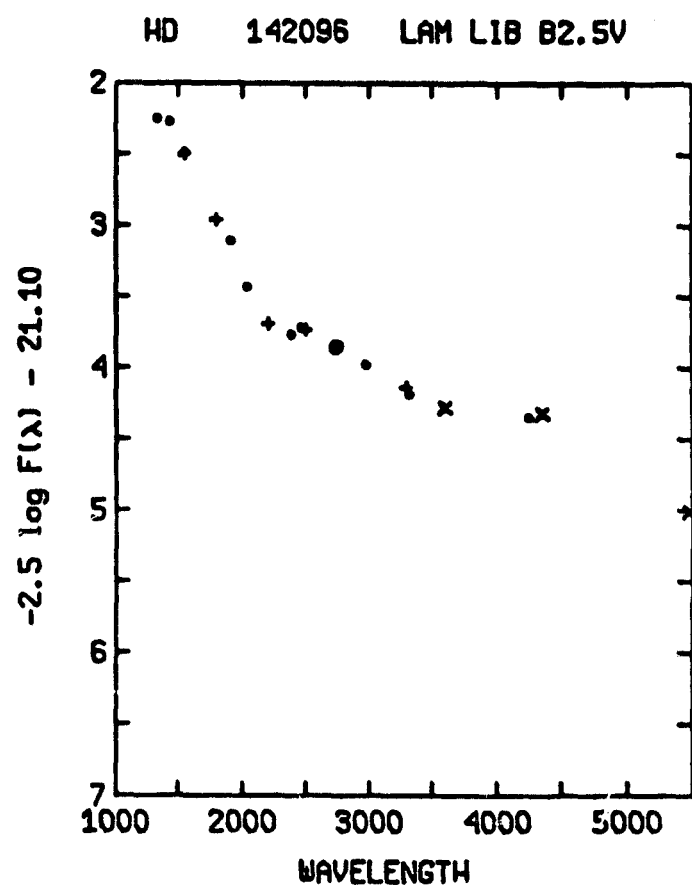
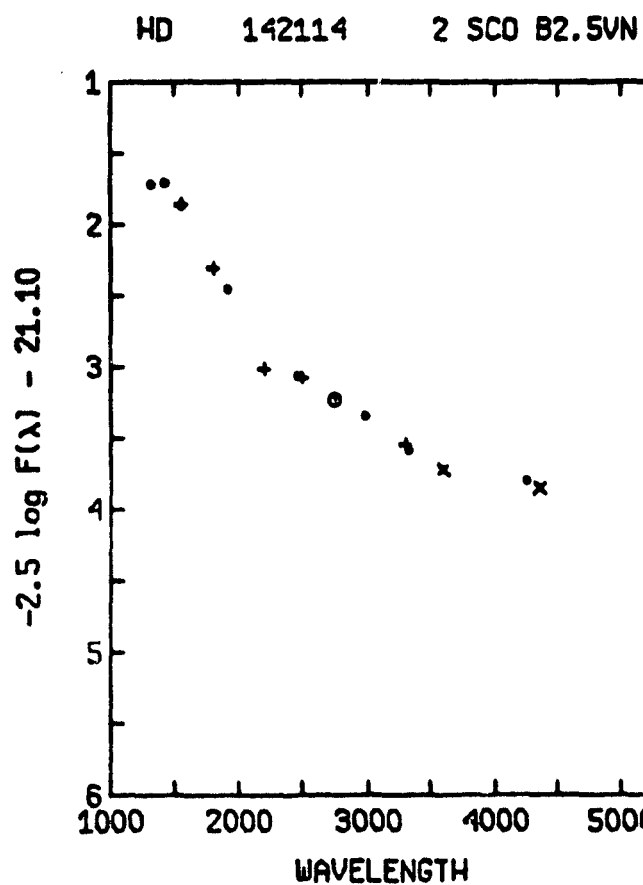
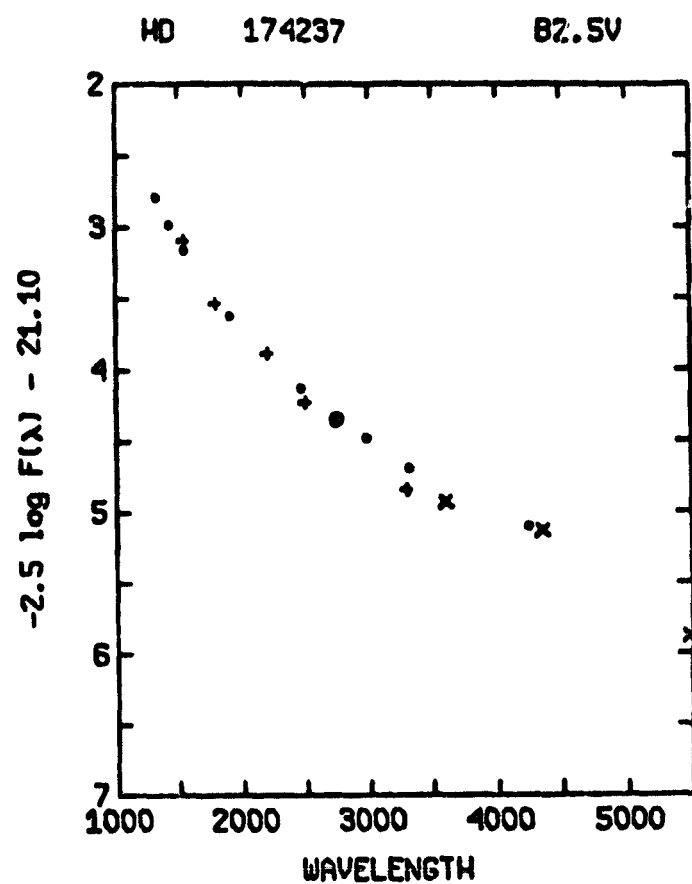
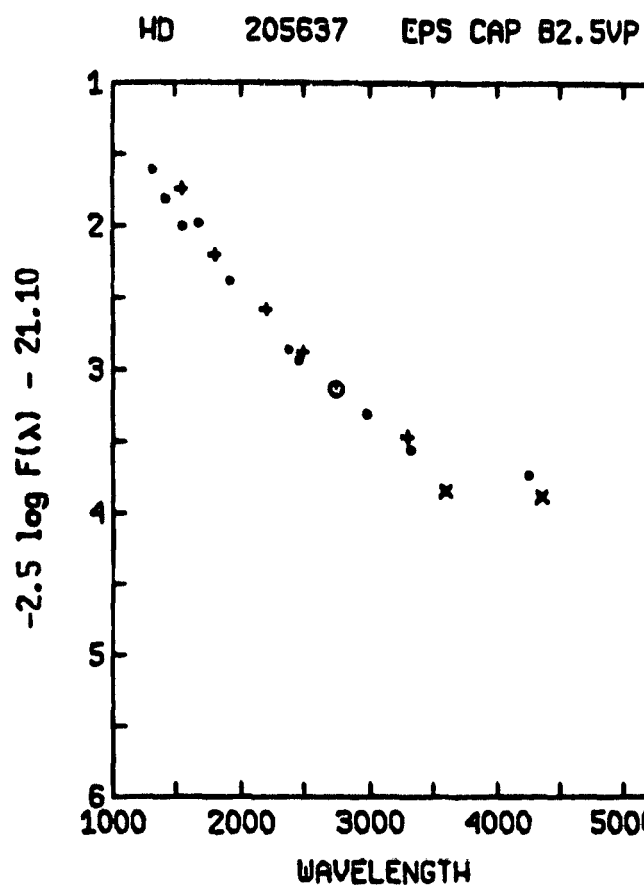
HD 93845 DEL2CHA B2.5IV



HD 193924 ALF PAV B2.5V

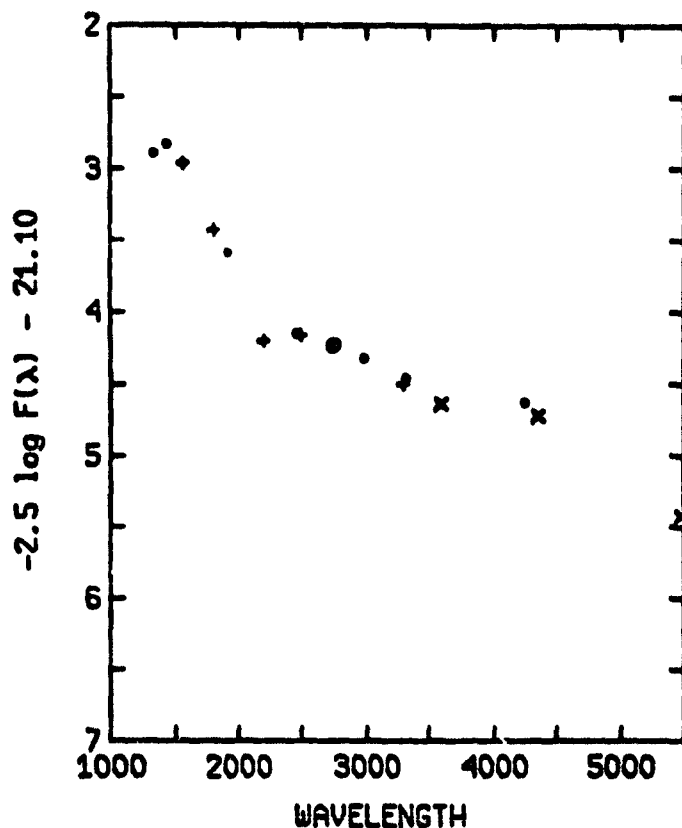




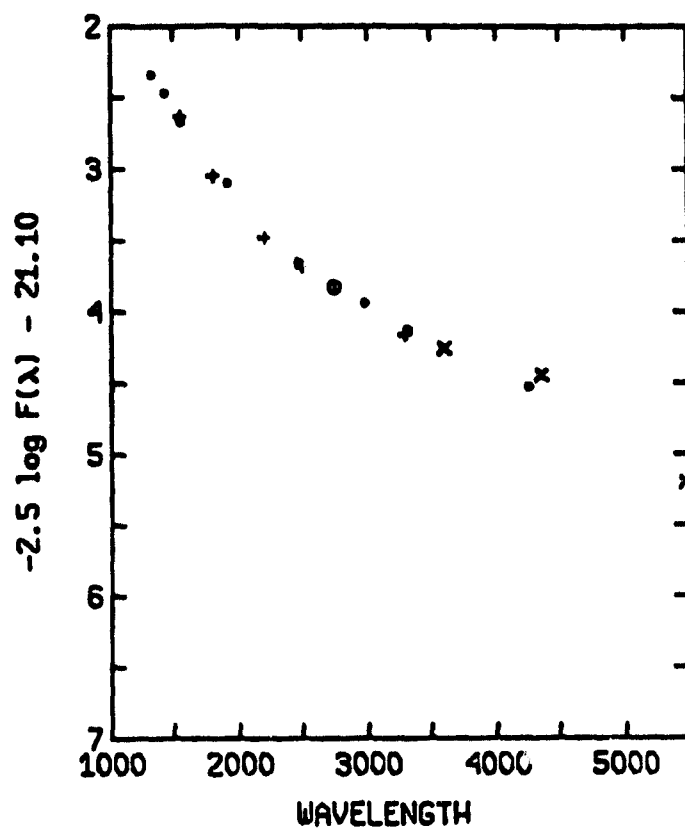


B2.5 stars
L13-L16

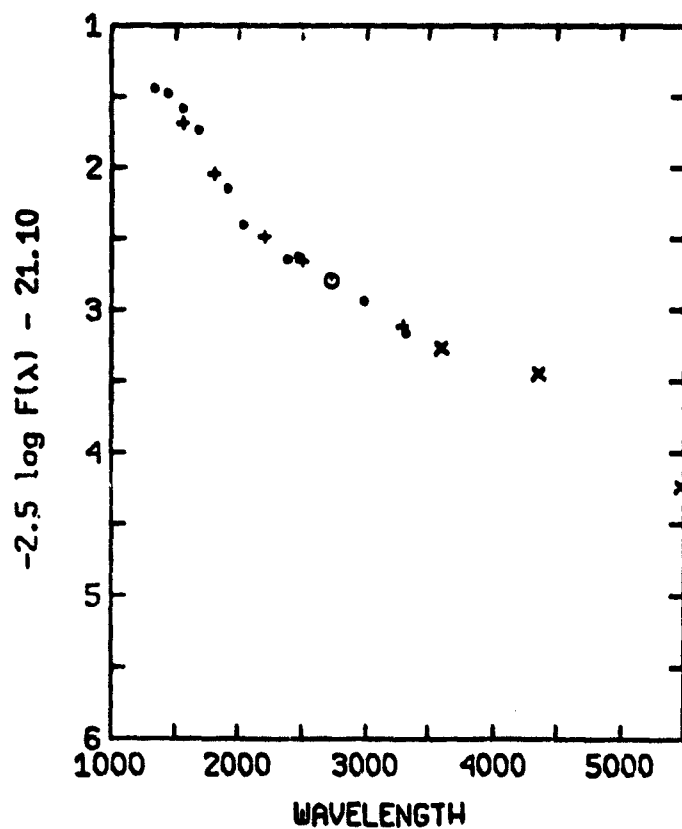
HD 142184 B2.5V



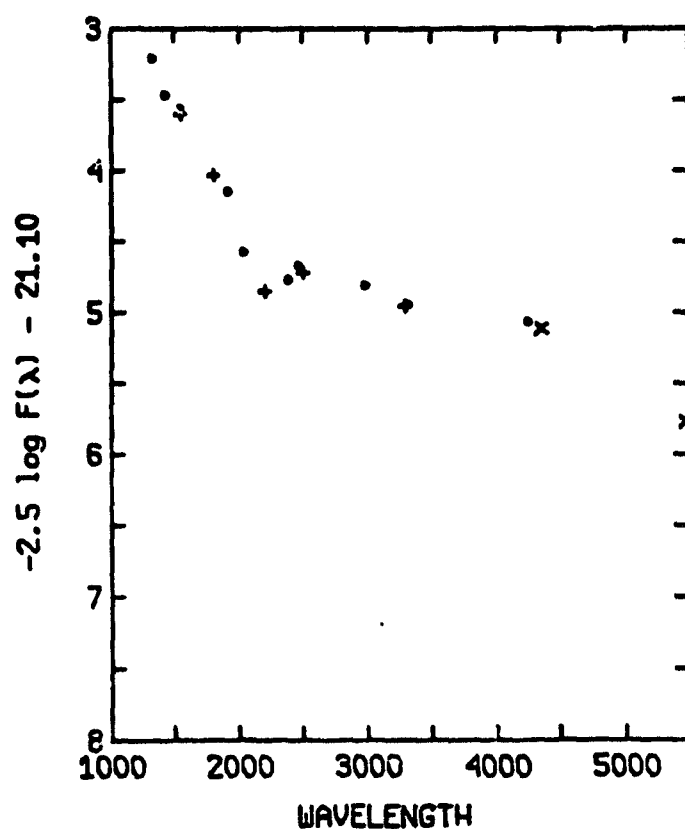
HD 32343/57 11/12CAM B2.5VE



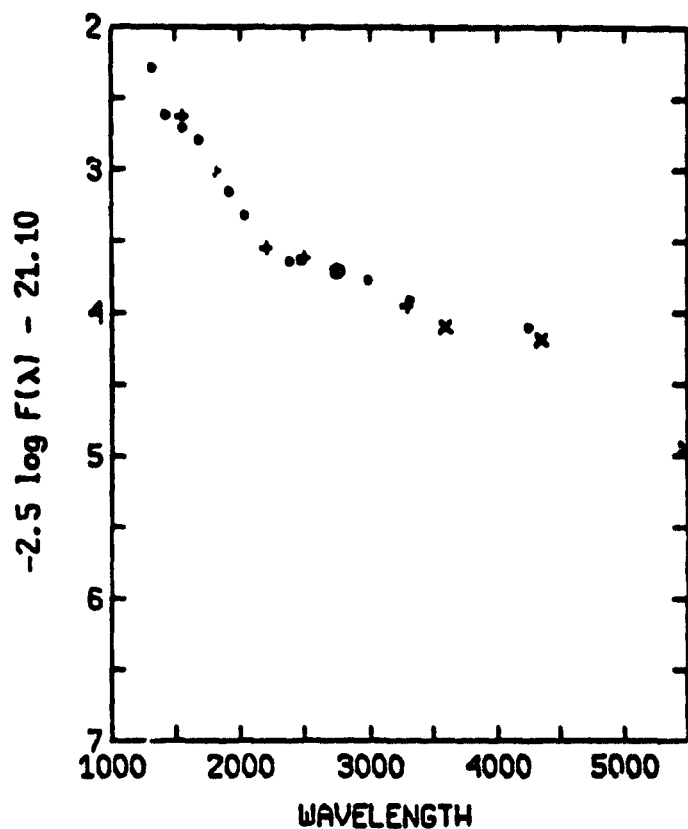
HD 207330 P12 CYG B2.5III



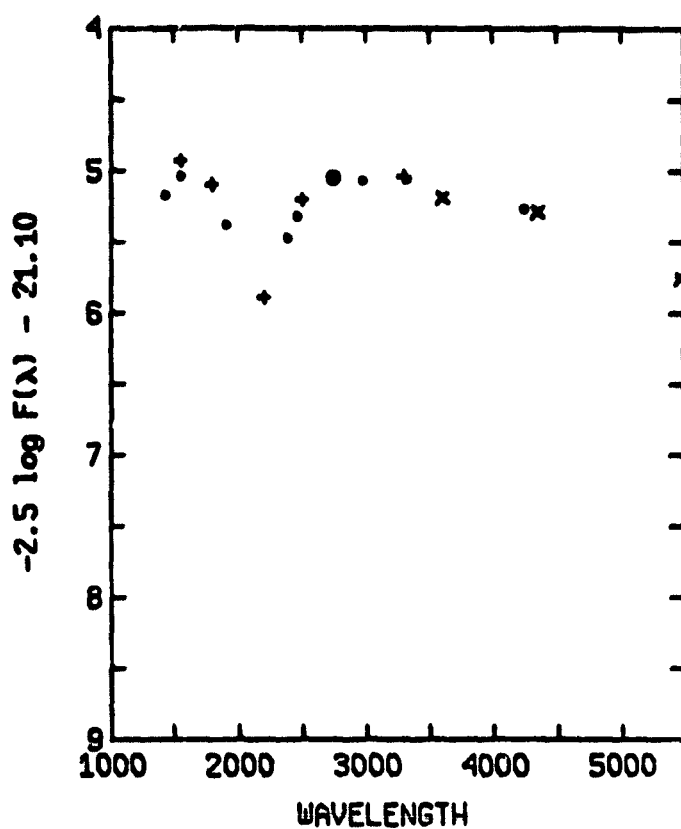
HD 93163 B2.5V



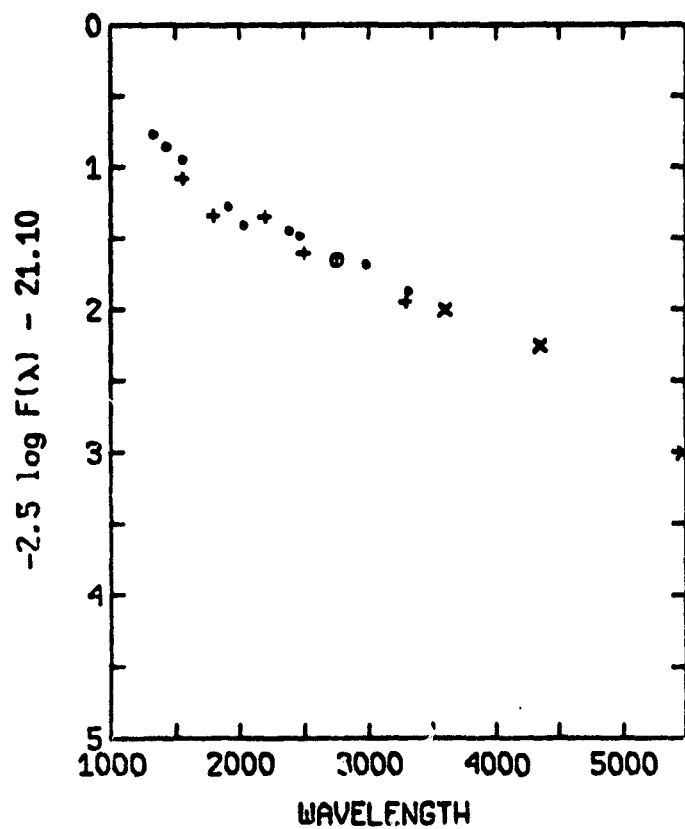
HD 195556 OMG1 CYG B2.5IV



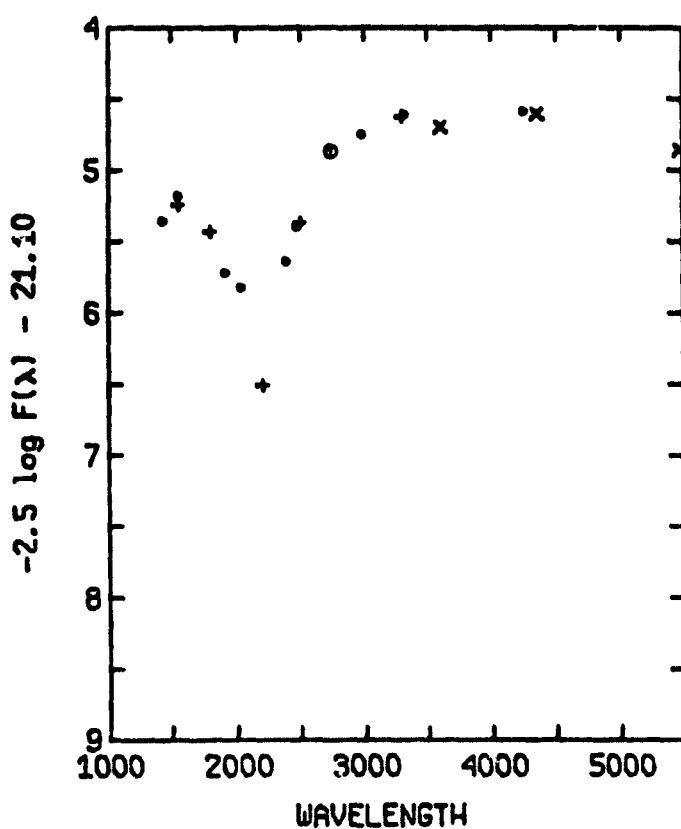
HD 42087 3 GEM B2.5IB



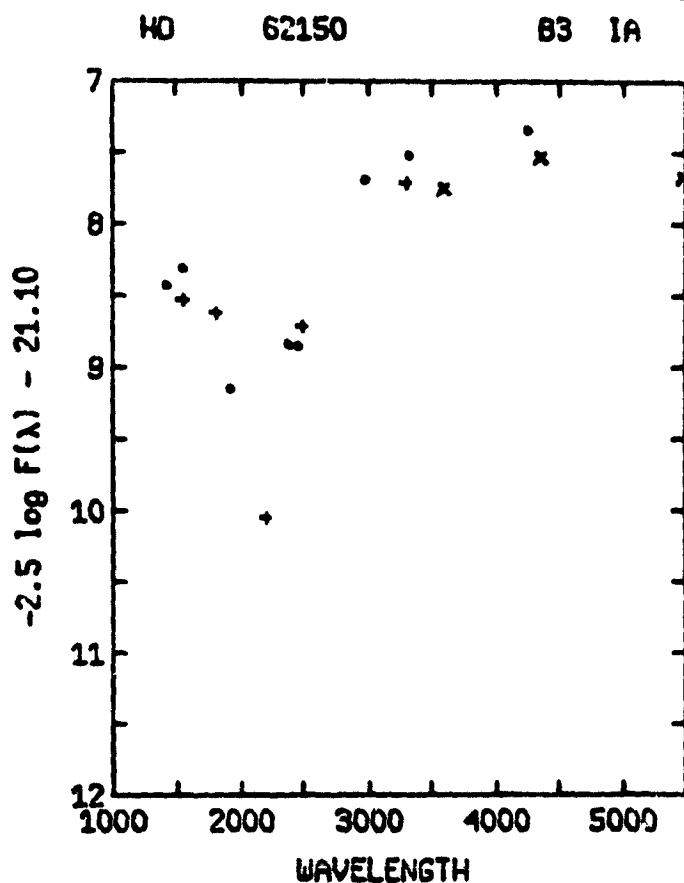
HD 53138 OM12CMA B3 IA



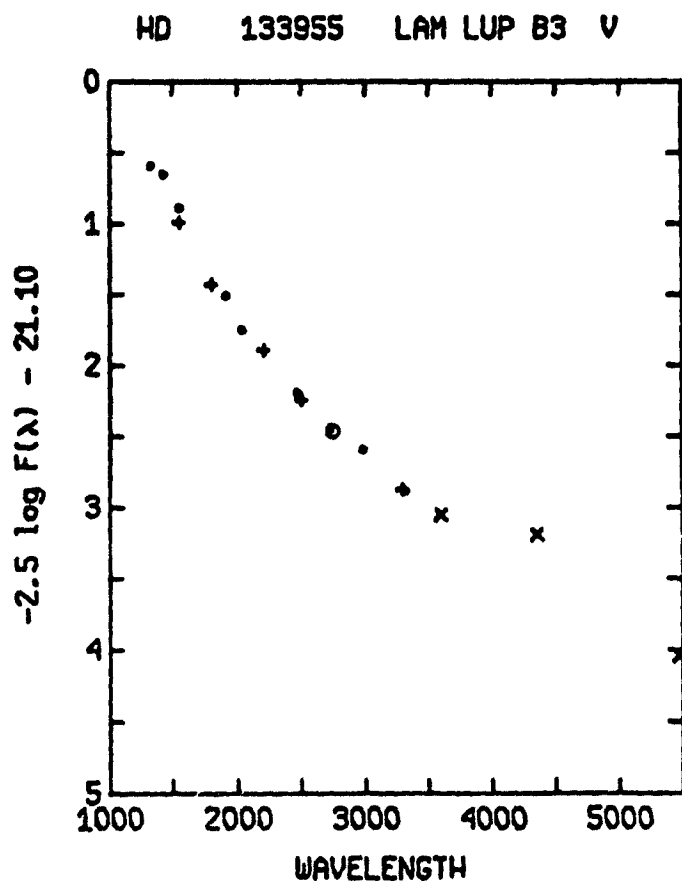
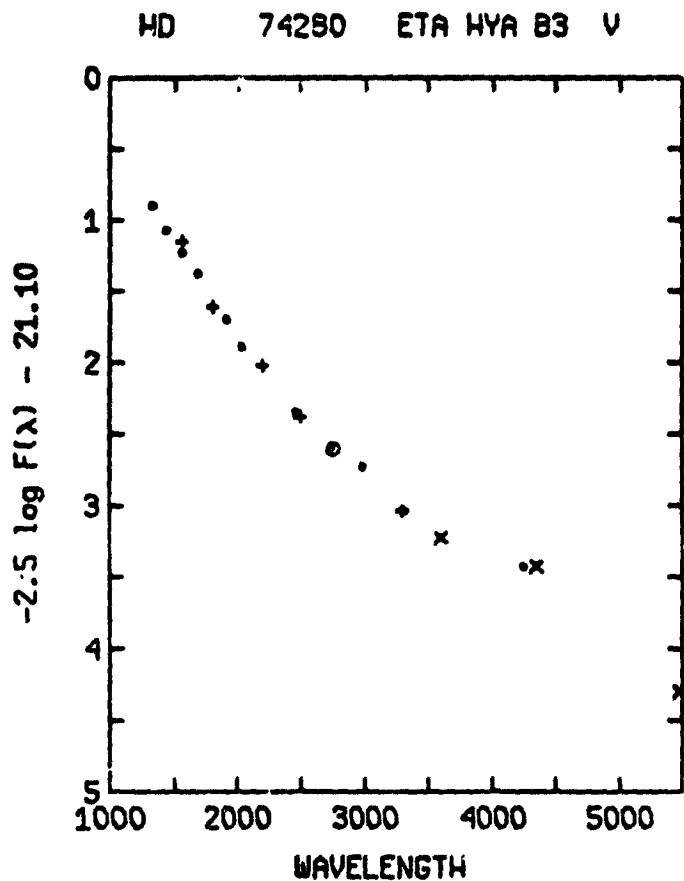
HD 198478 55 CYG B3 IA

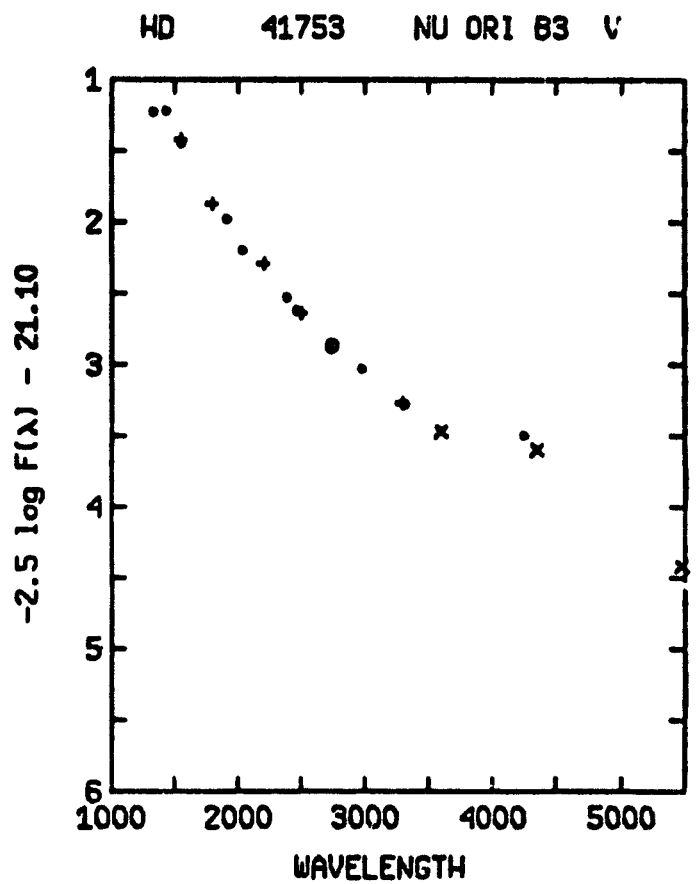
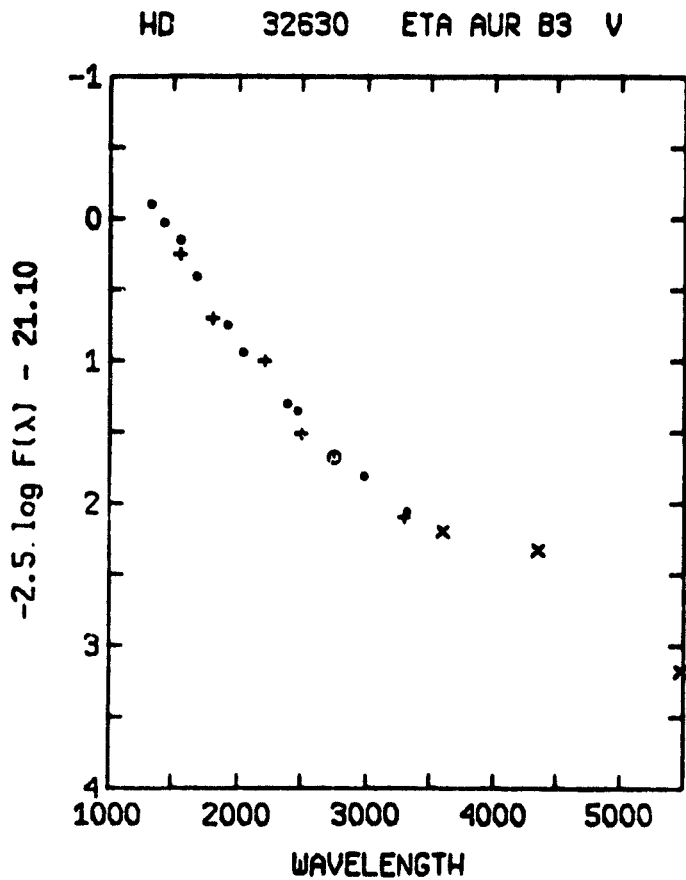
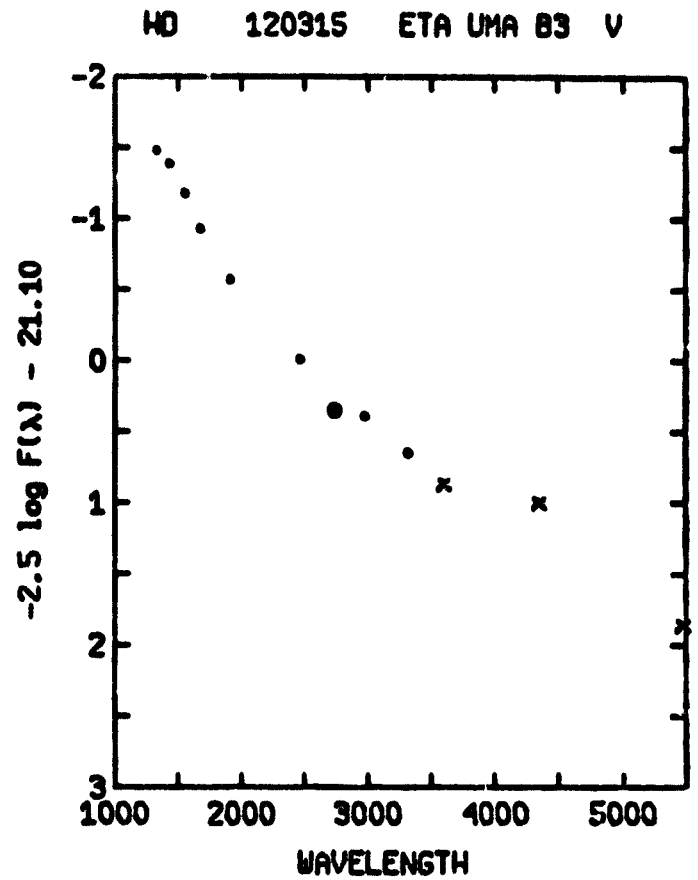
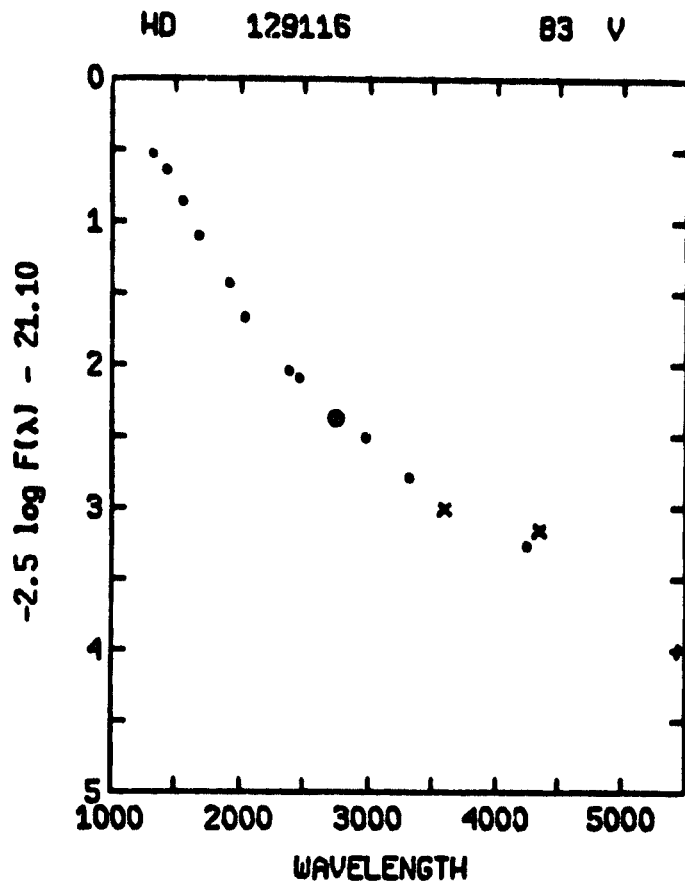


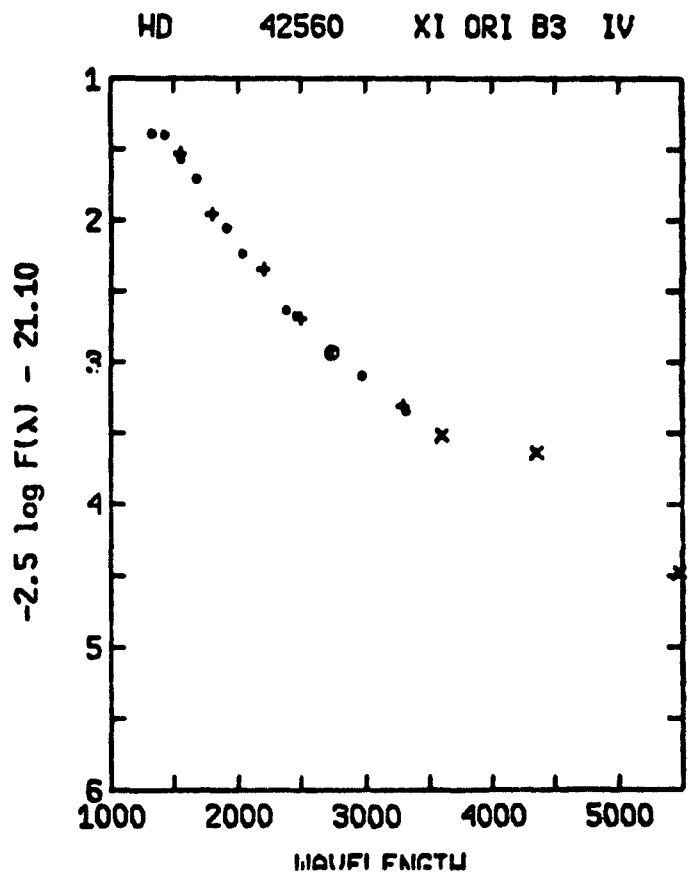
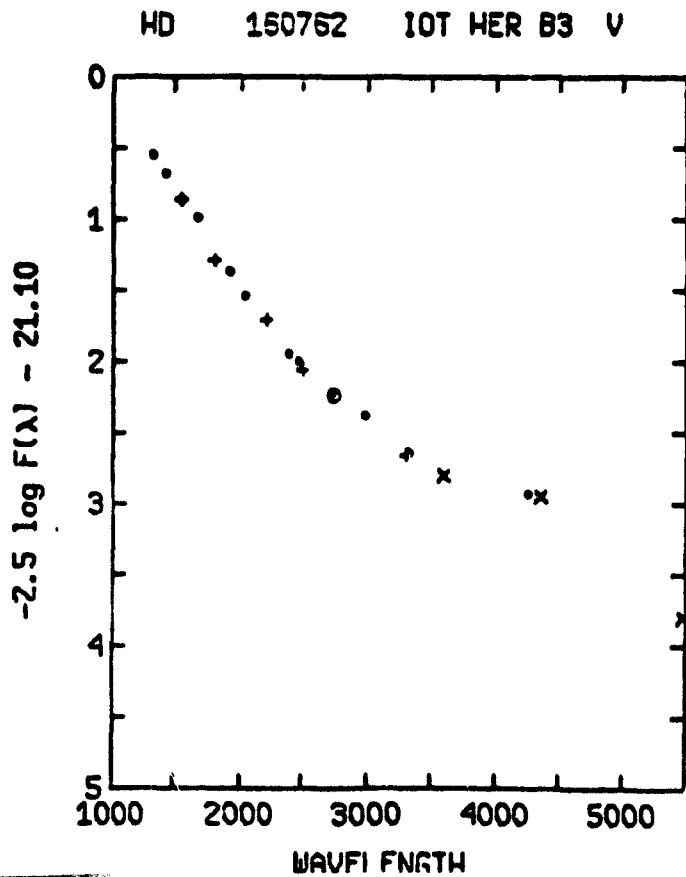
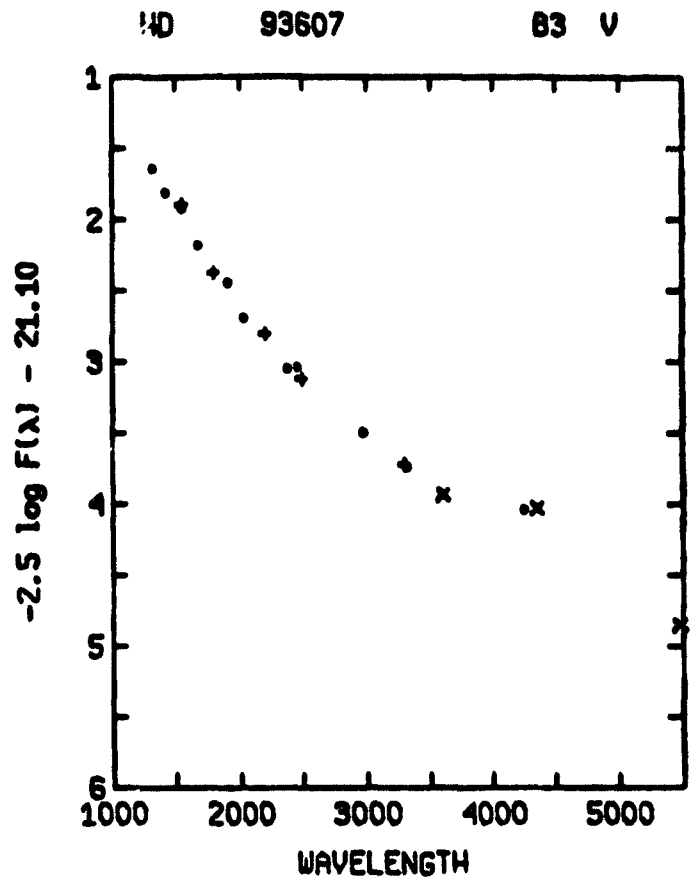
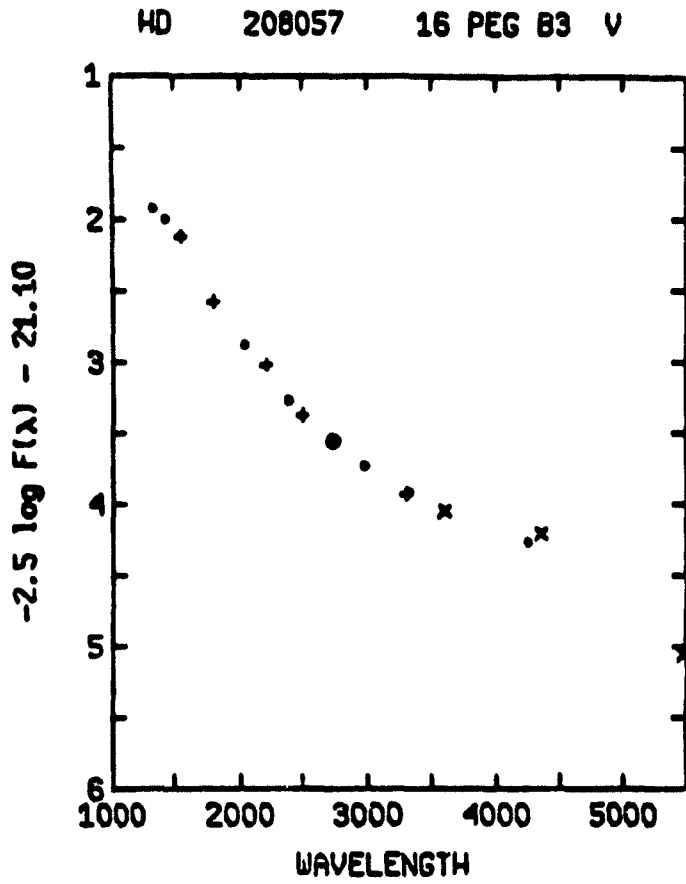
B3 I stars
M3



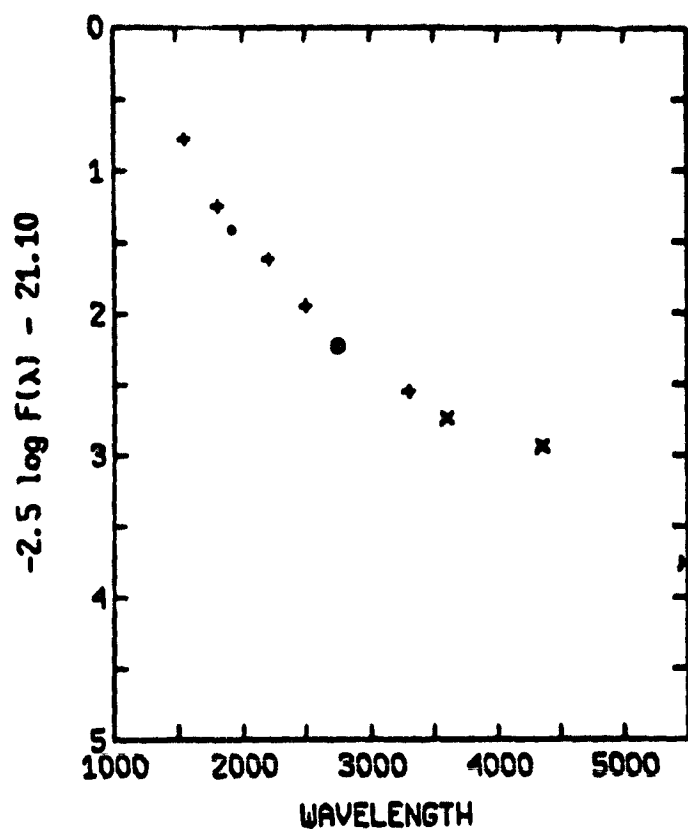
B3 IV-V stars
N1-N2



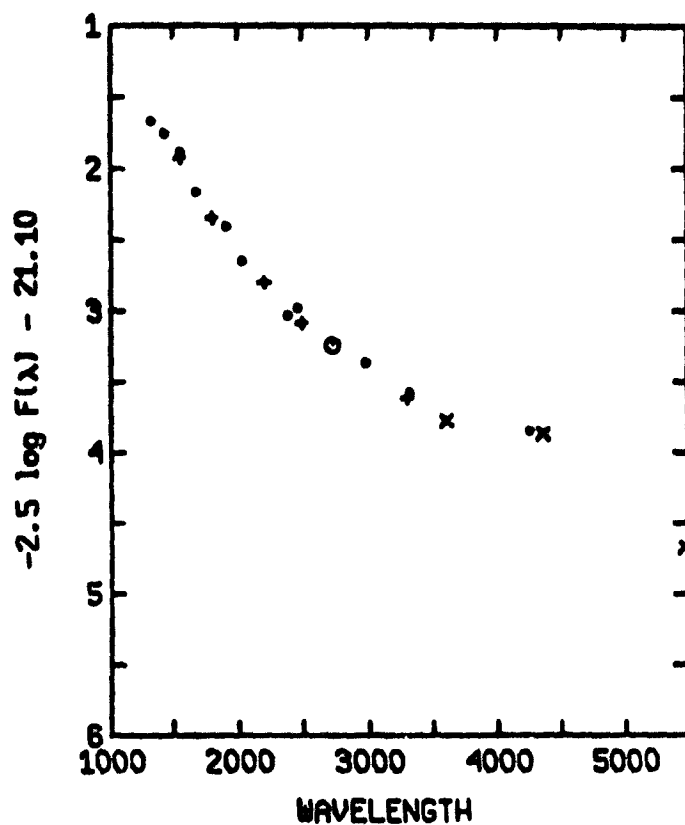




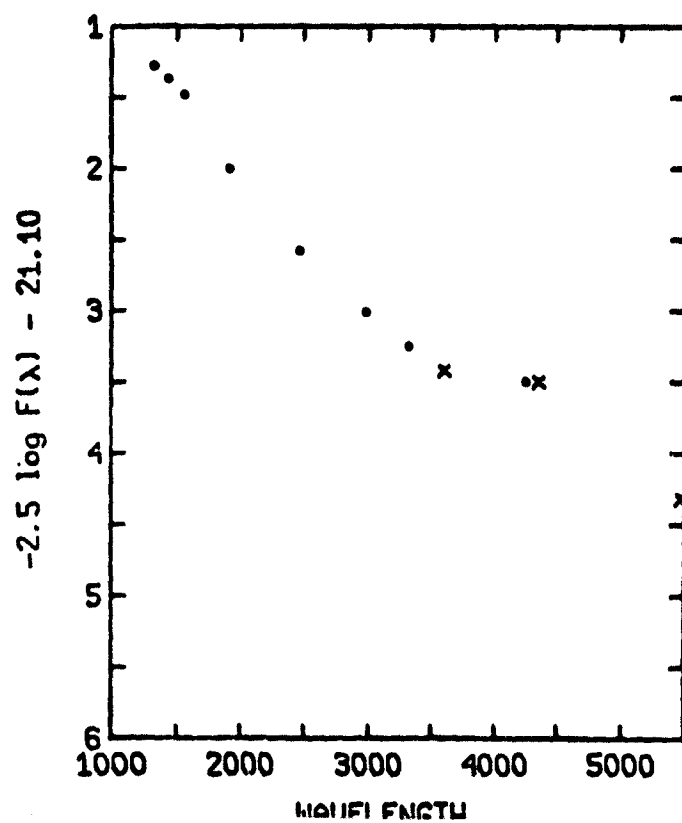
HD 45725/7 BET MON B3 VE



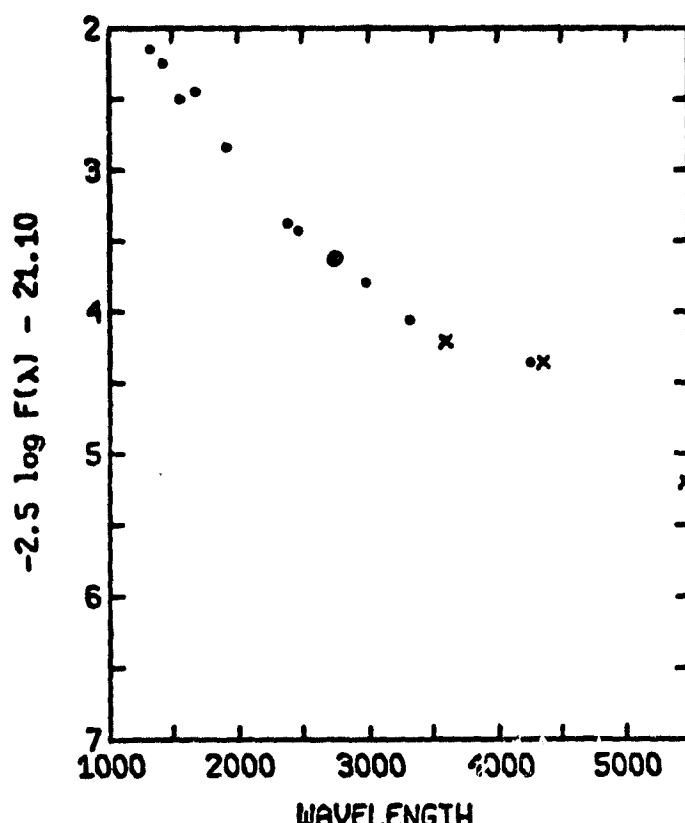
HD 16909 35 ARI B3 V

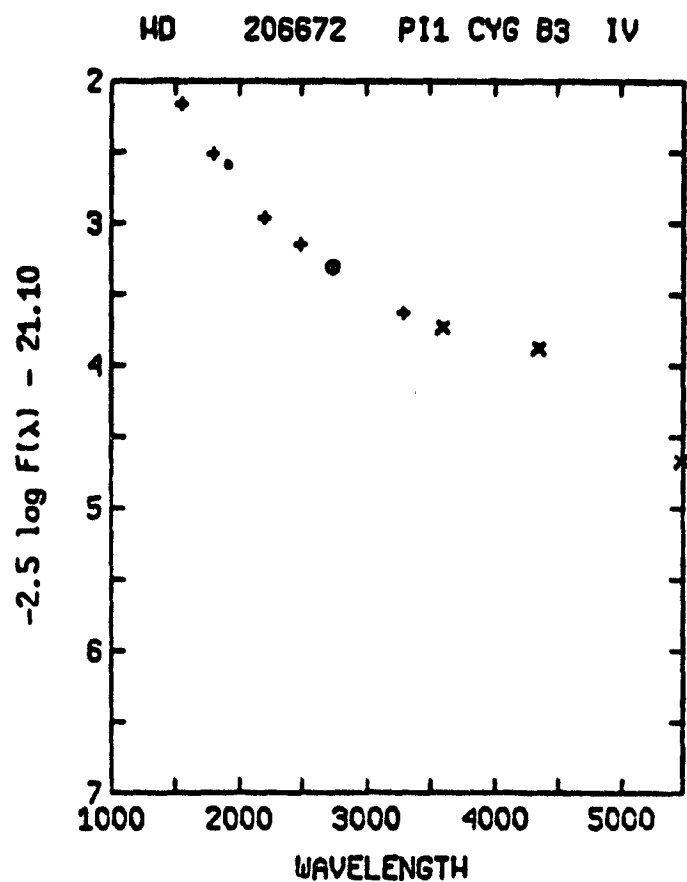
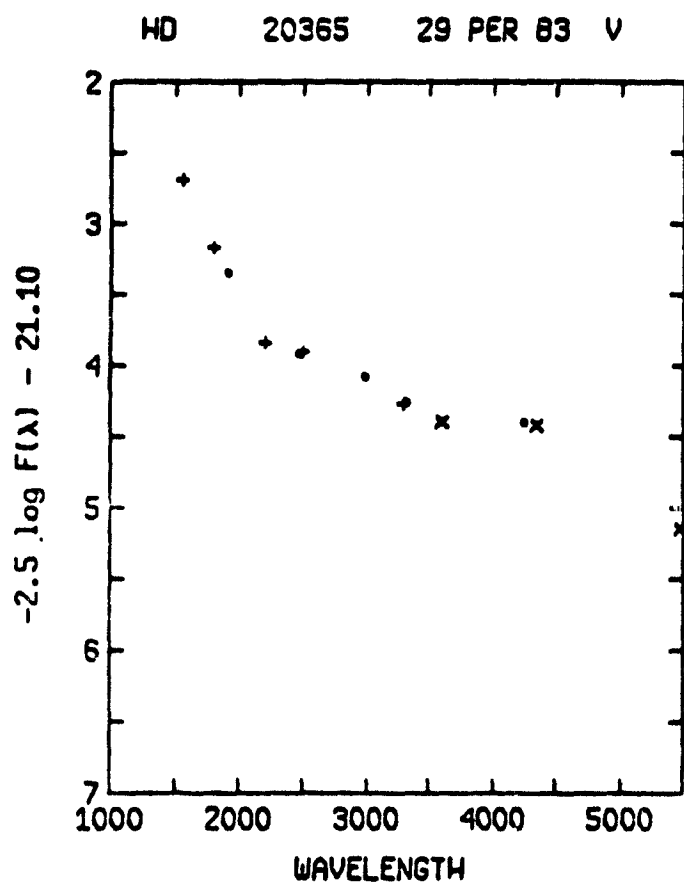
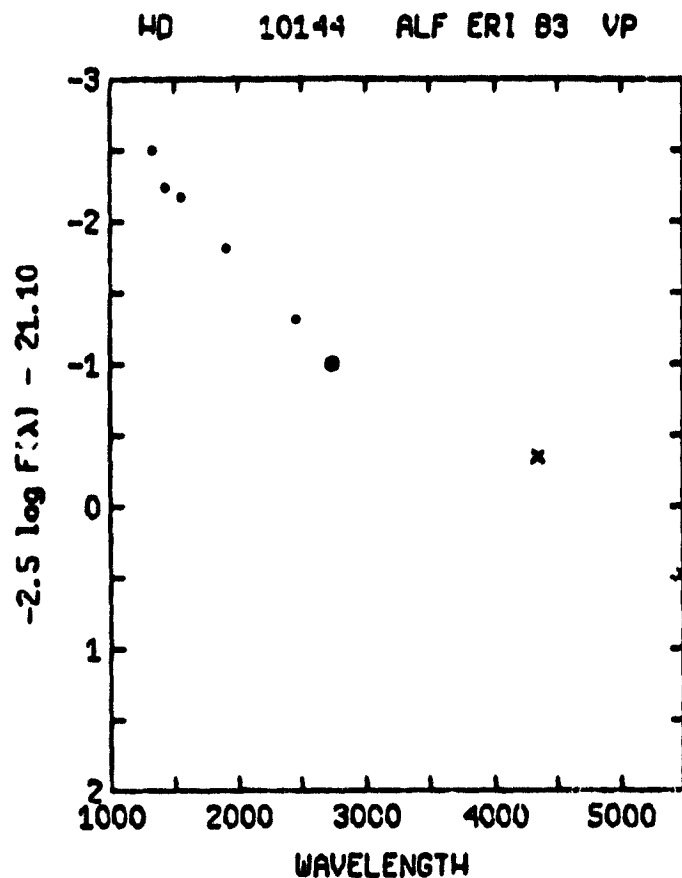
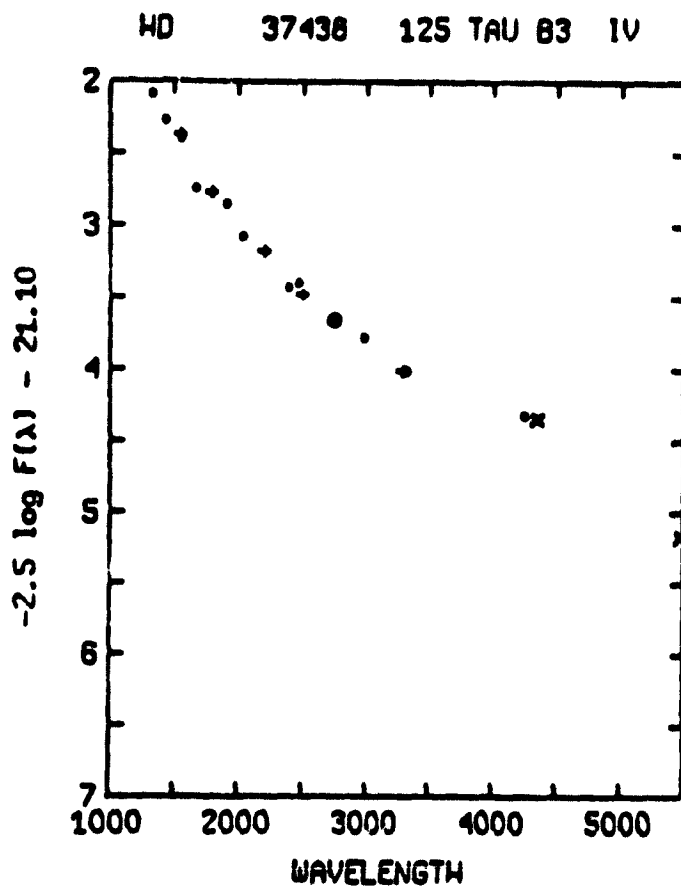


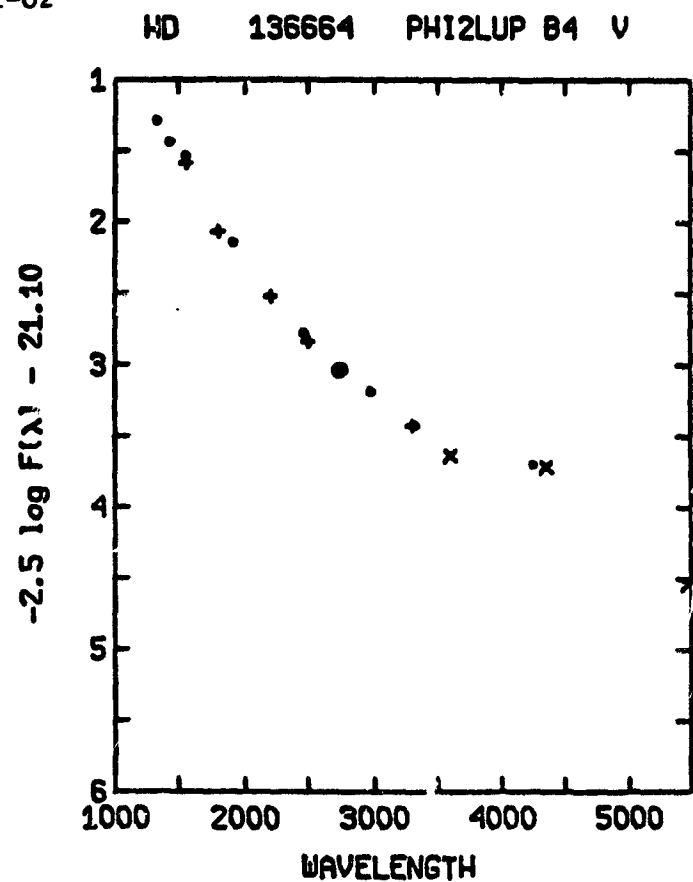
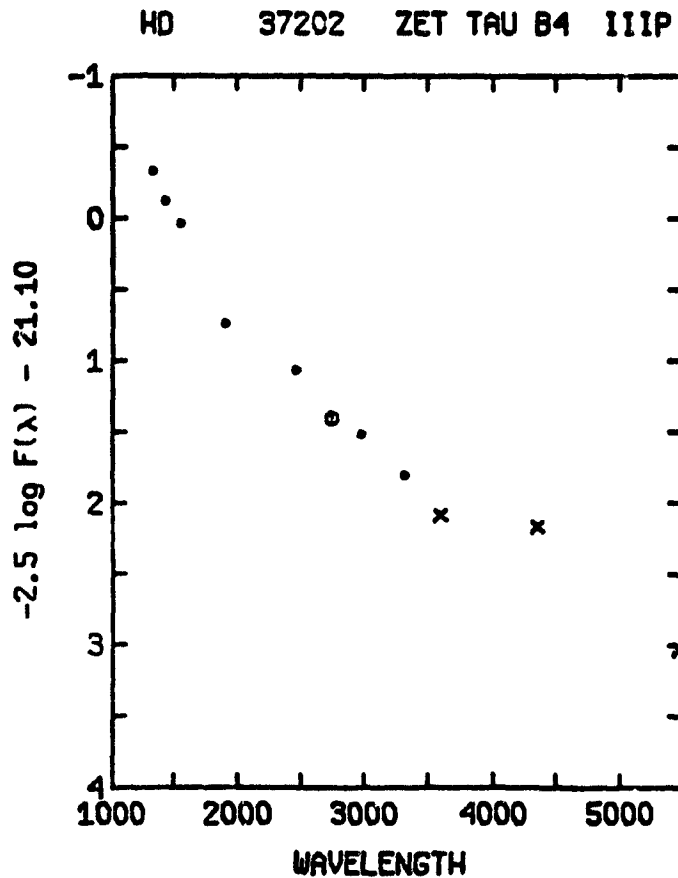
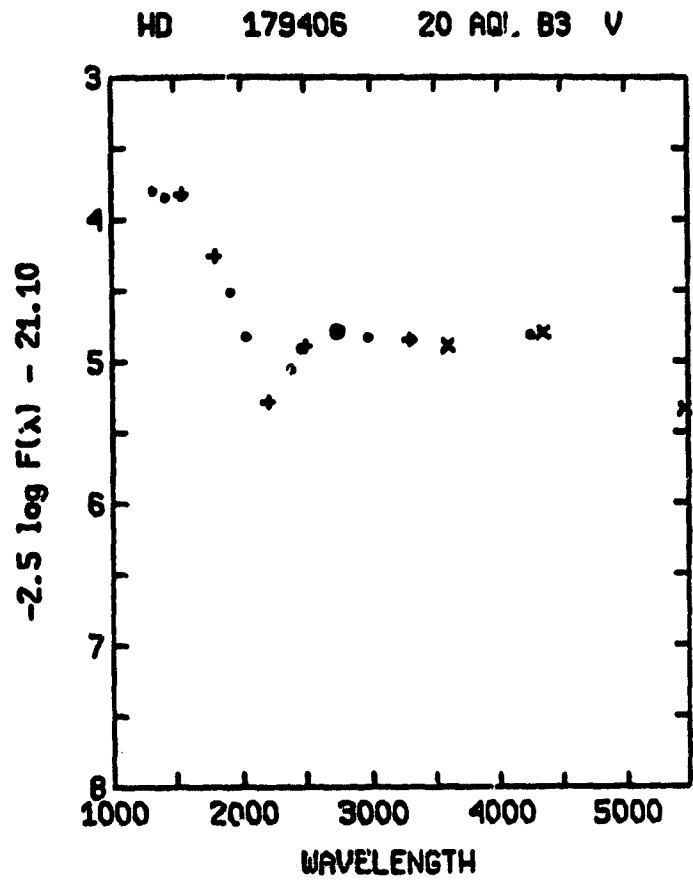
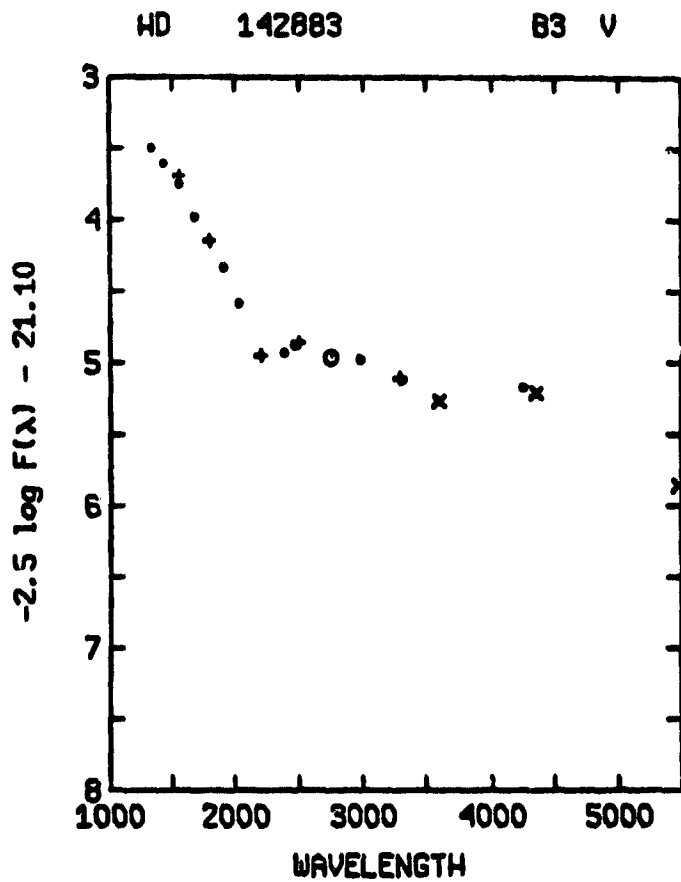
HD 102776 B3 V



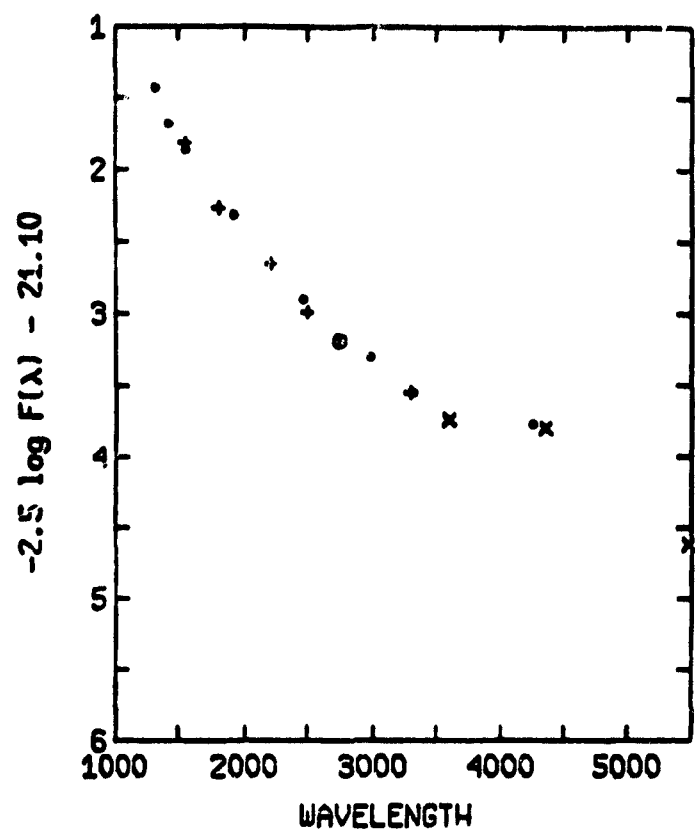
HD 189687 25 CYG B3 IV



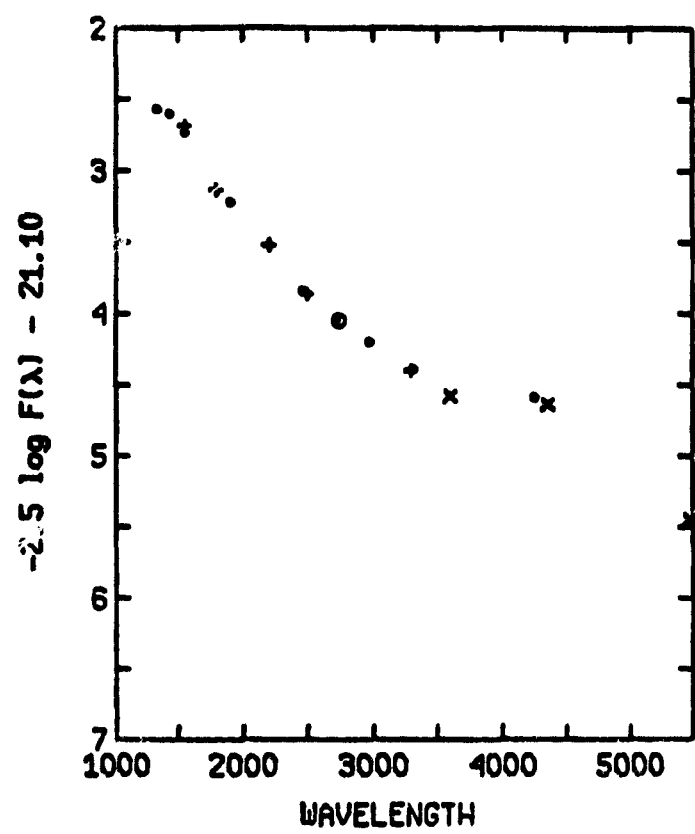




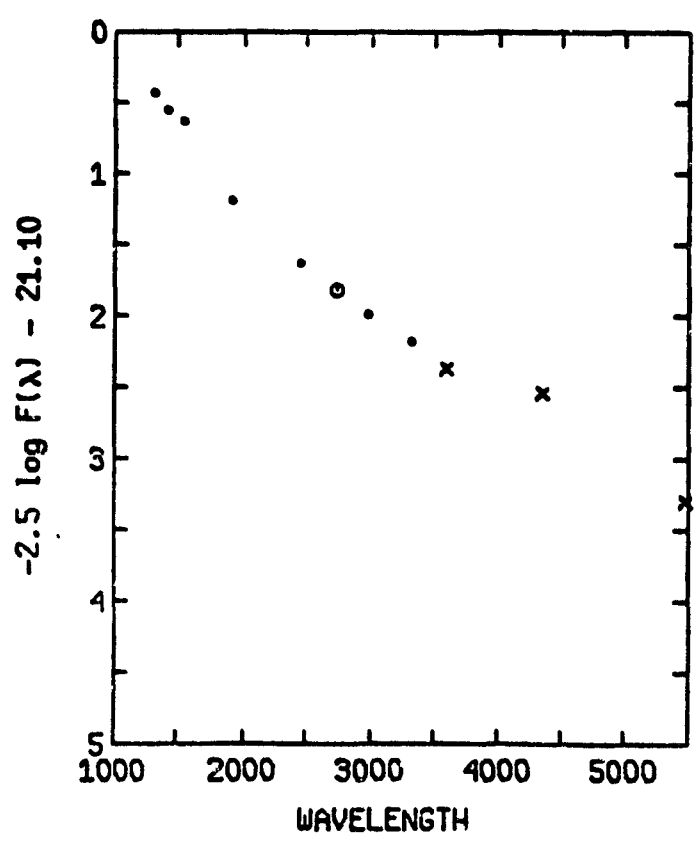
HD 112078 LAM CRU B4 VN



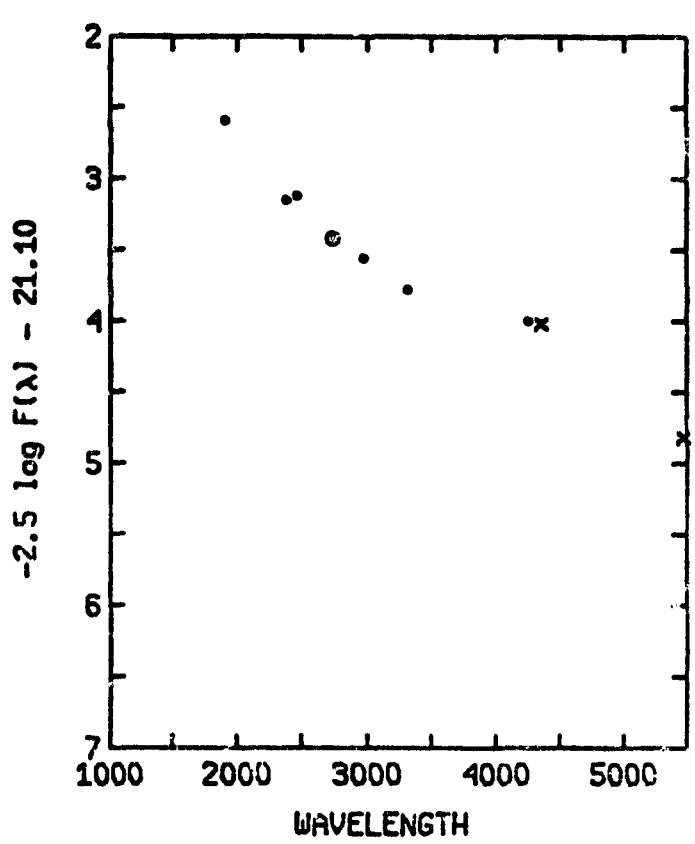
HD 137432 B4 VP

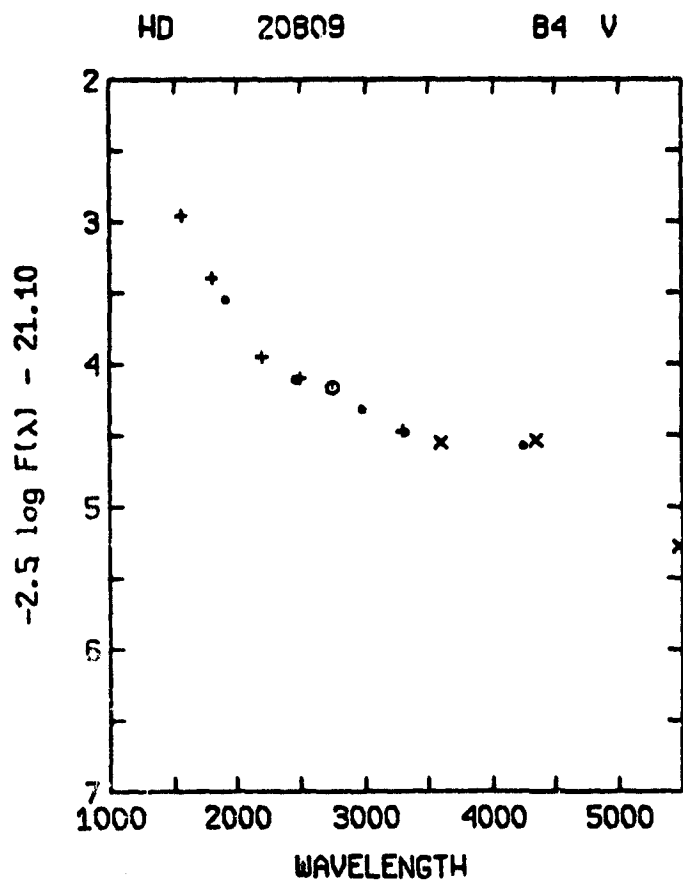
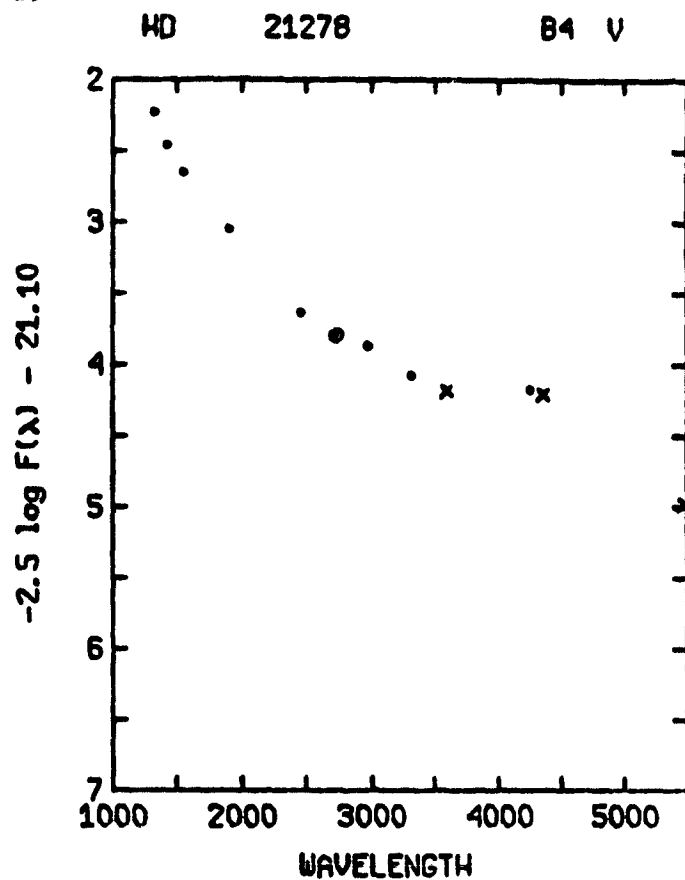
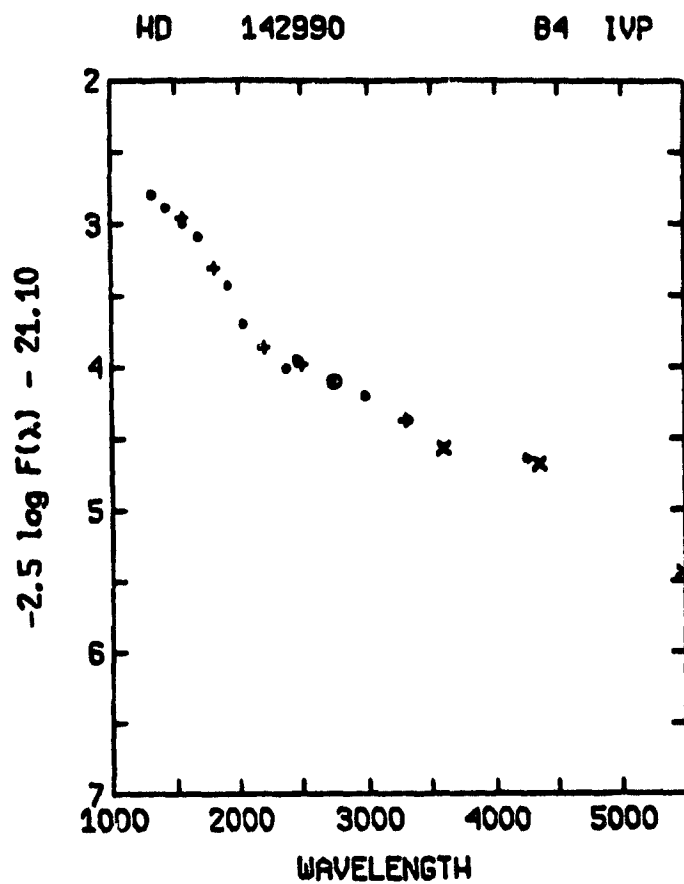


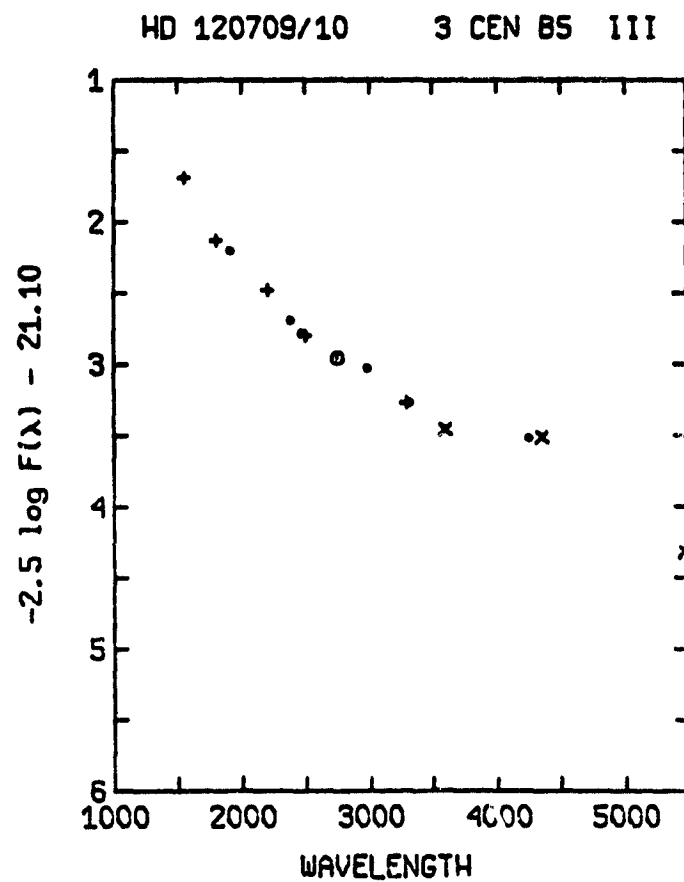
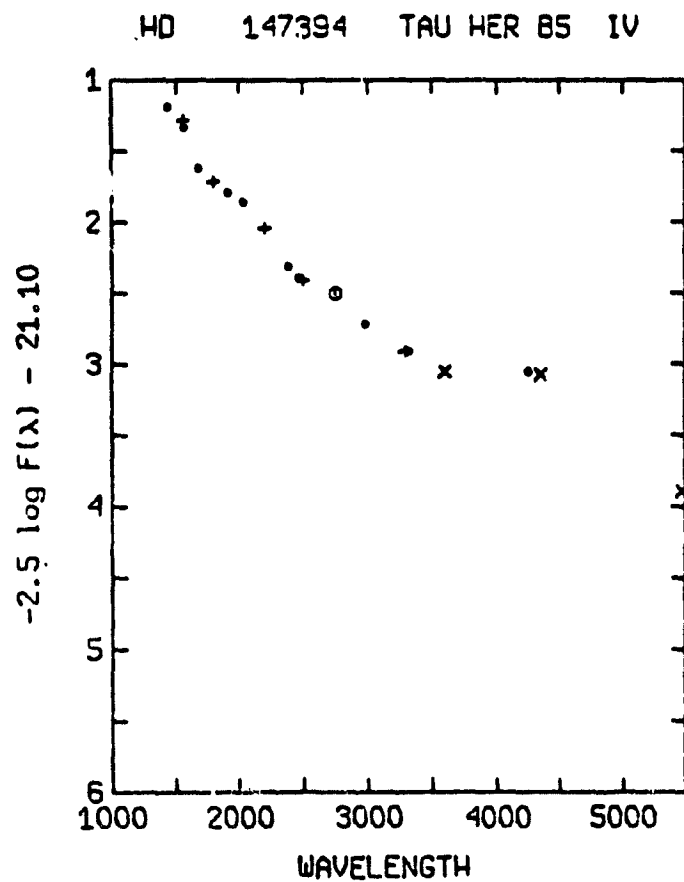
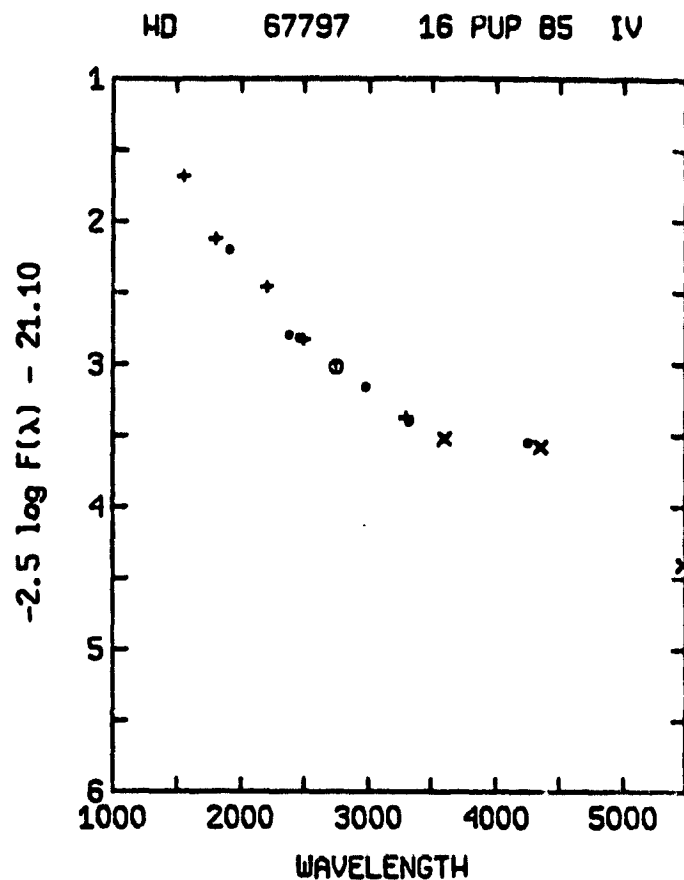
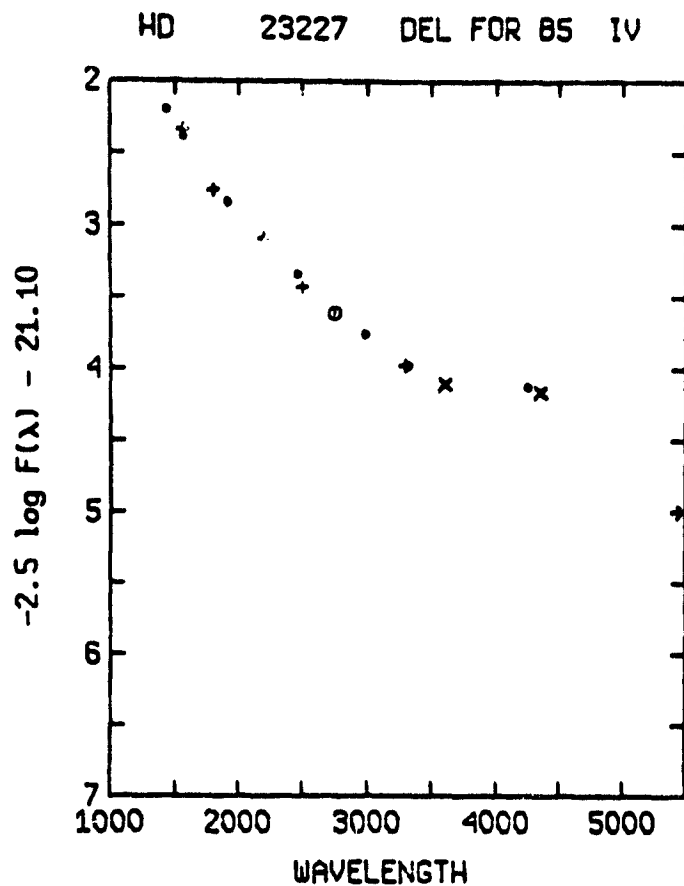
HD 91455 PP CAR B4 VNE



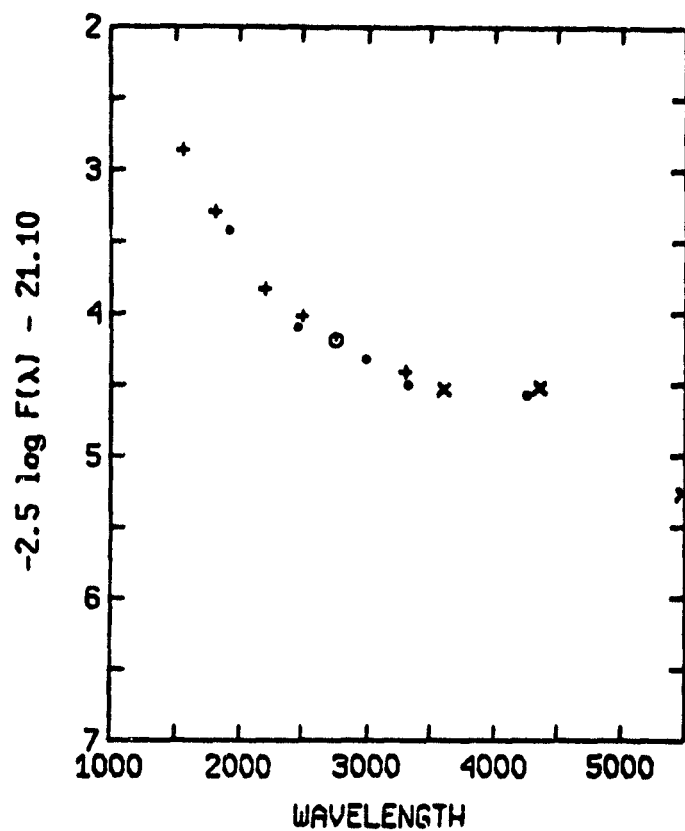
HD 93194 B4 IVN



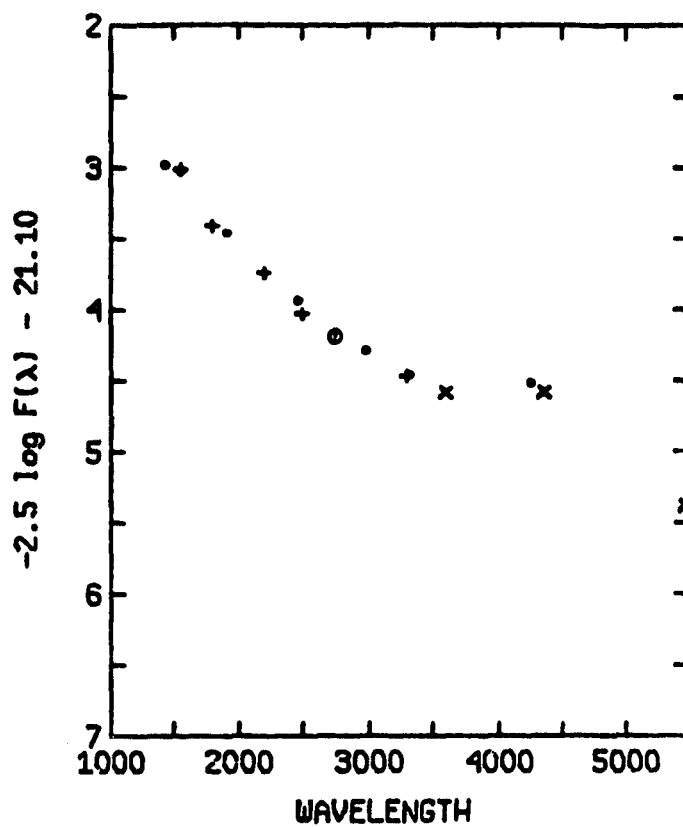




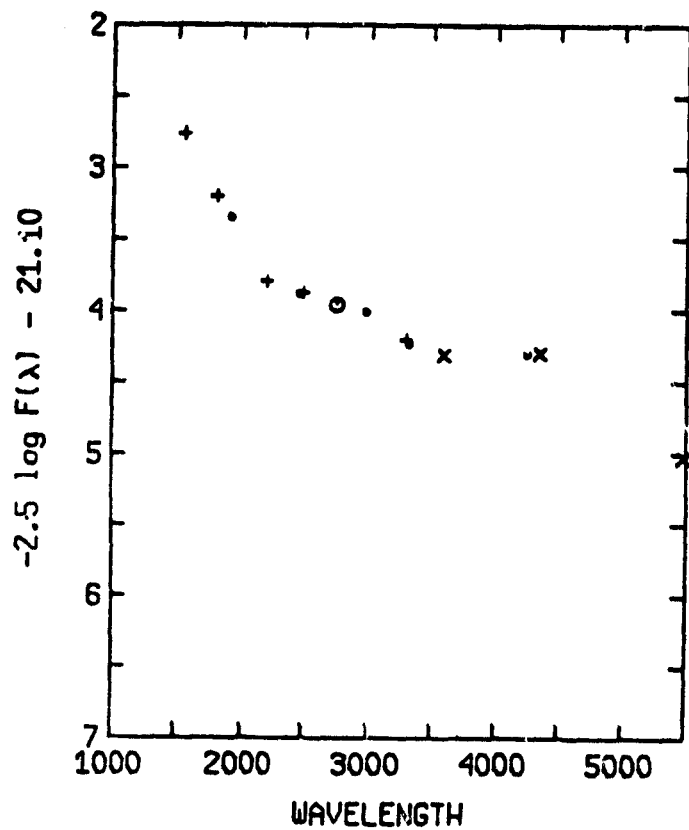
HD 20756 TAU ARI B5 IV



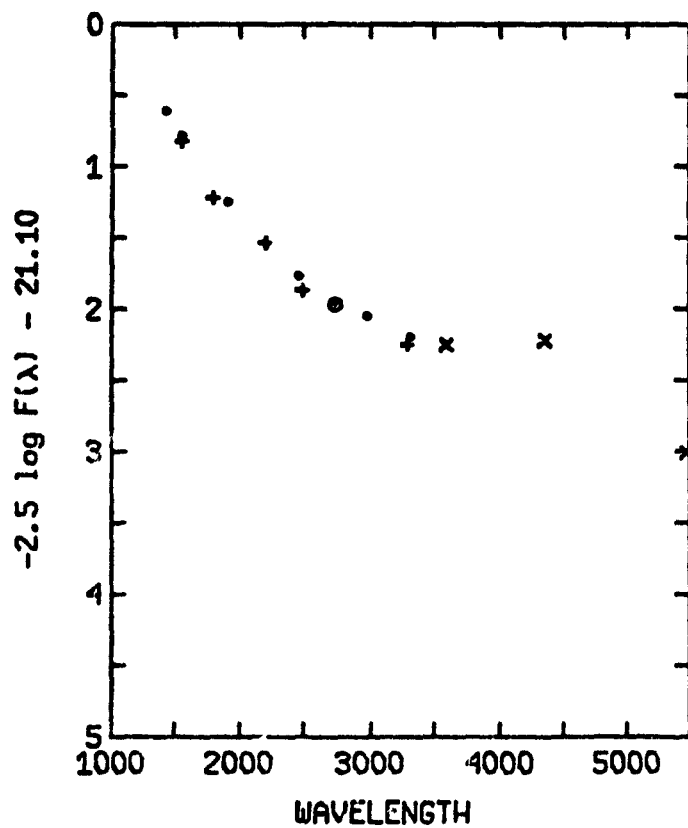
HD 41692 B5 IV

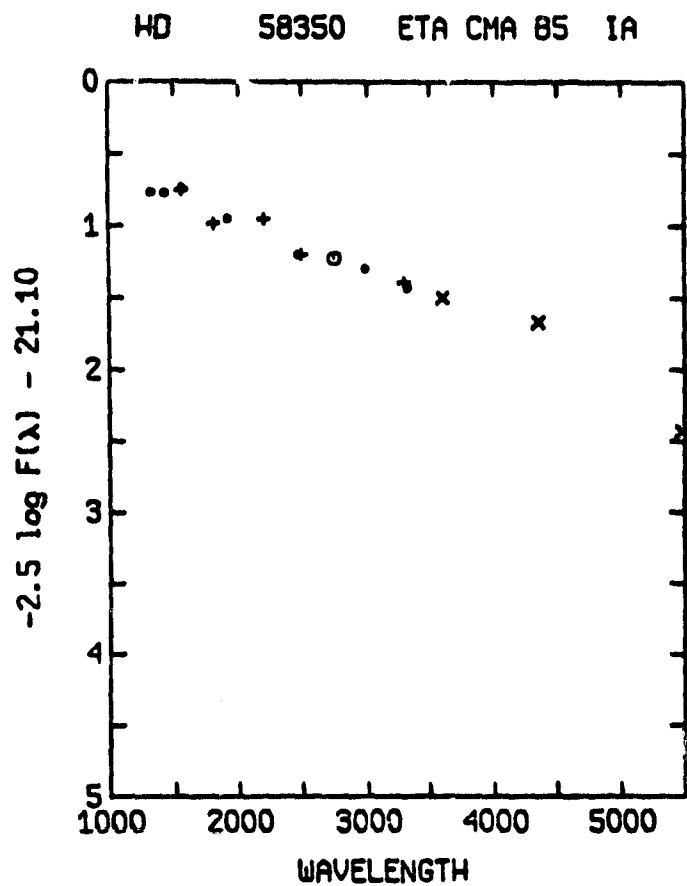


HD 20418 31 PER B5 IV

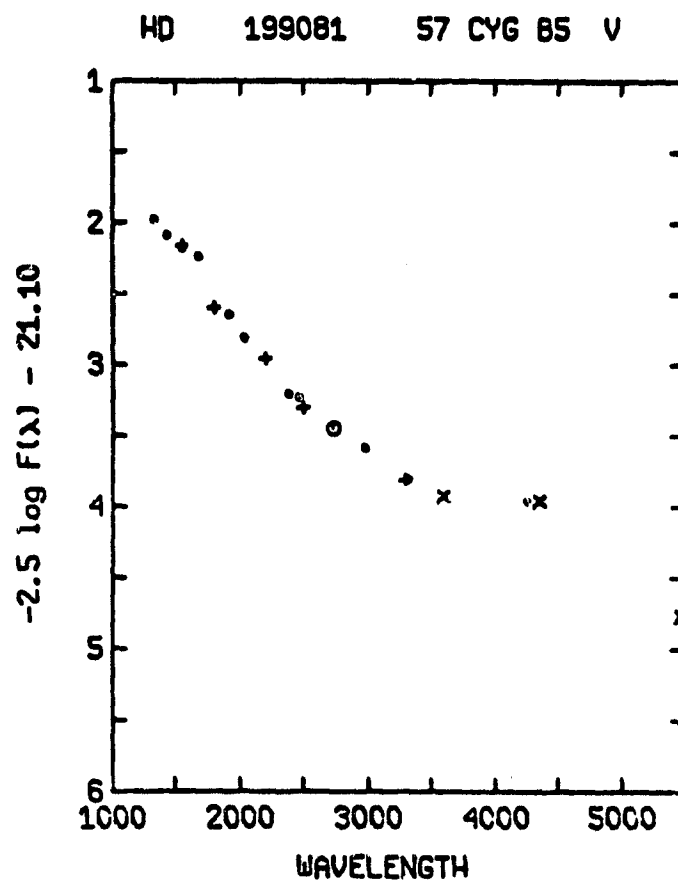
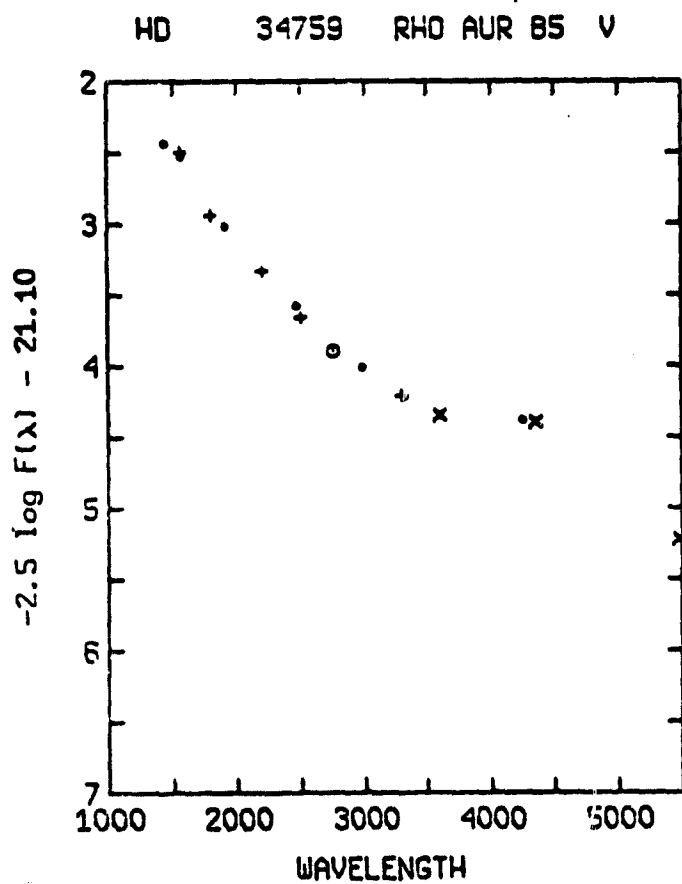


HD 22928 DEL PER B5 III

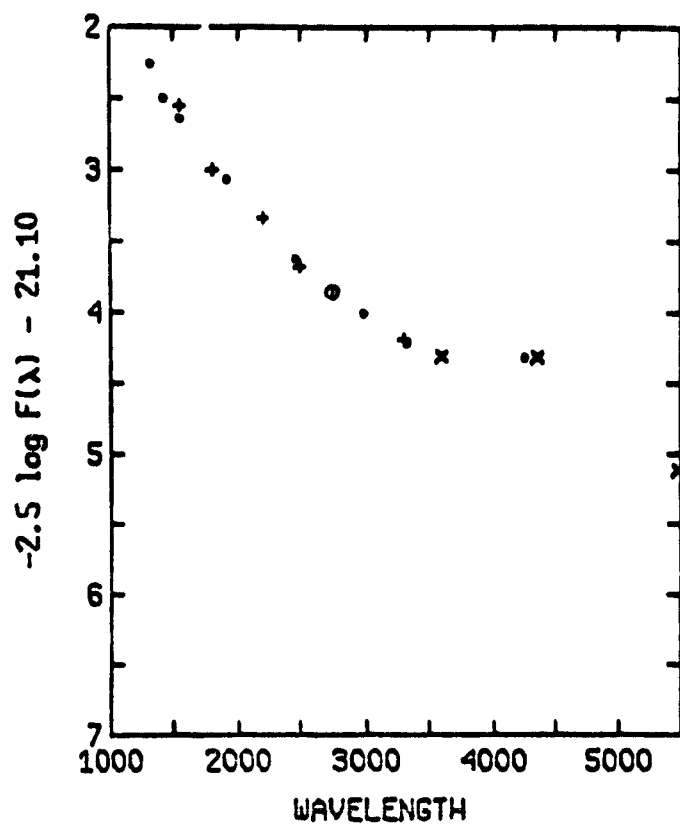




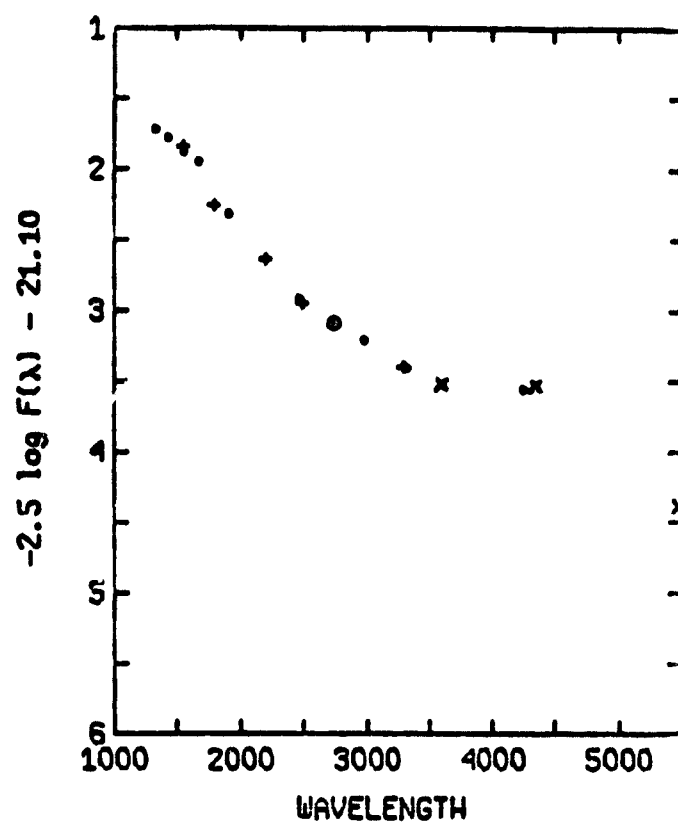
B5 V stars
Q1-Q2



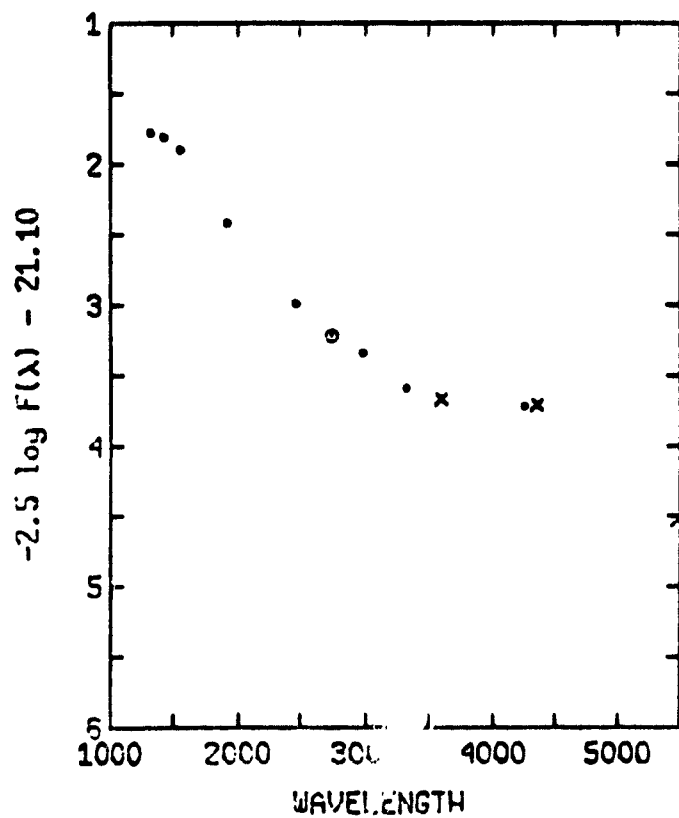
HD 188665 23 CYG B5 V



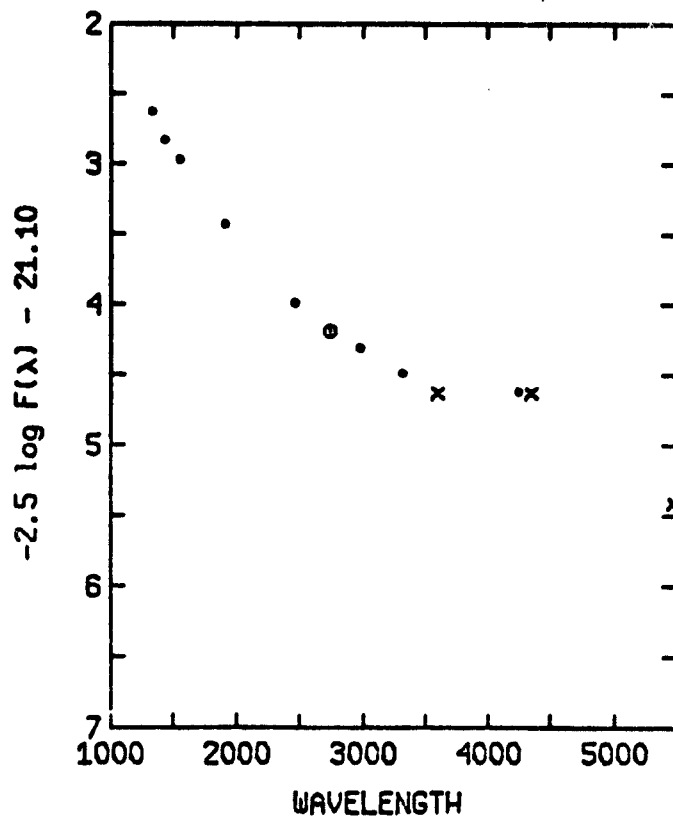
HD 3369 P1 AND B5 V



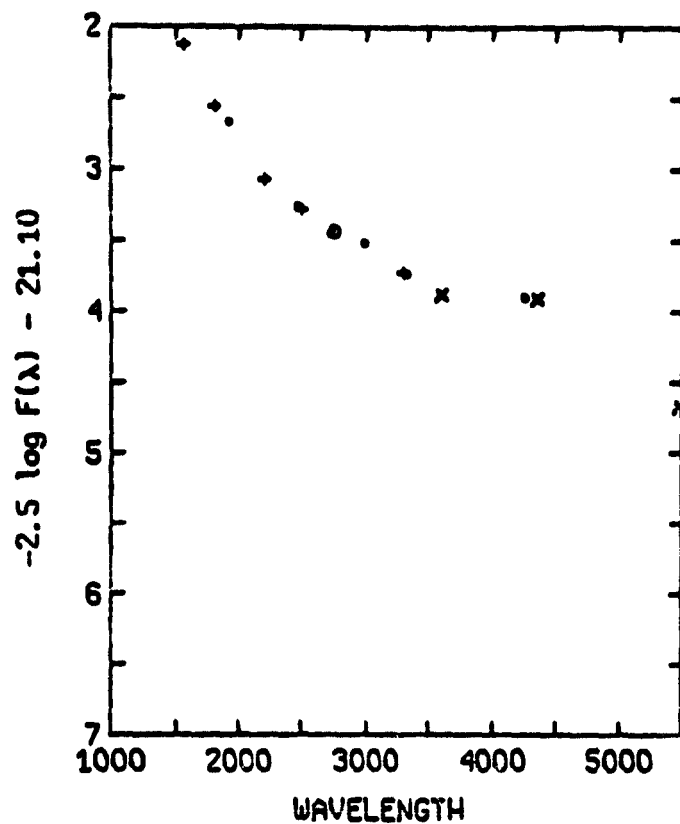
HD 4727 NU AND B5 V



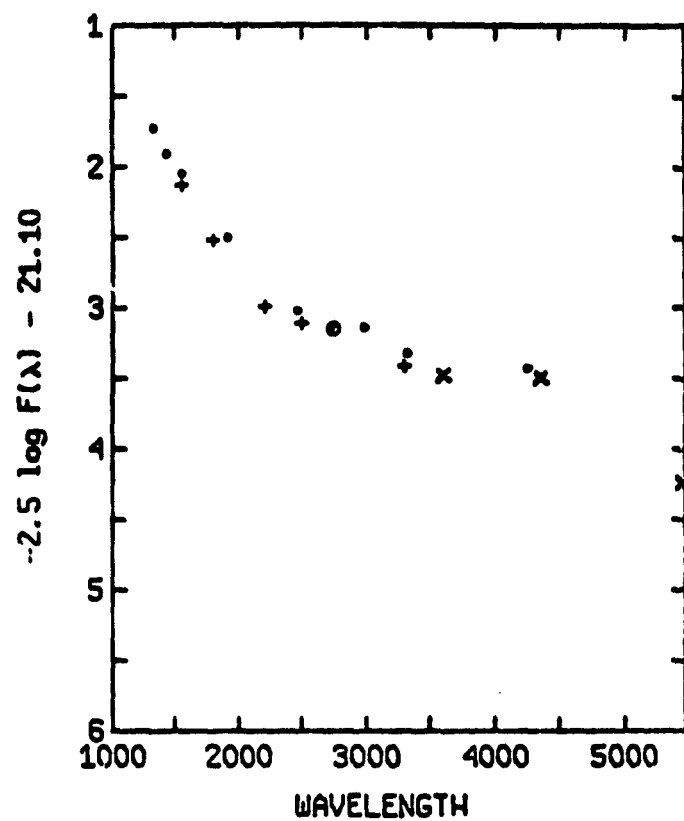
HD 35671 115 TAU B5 V



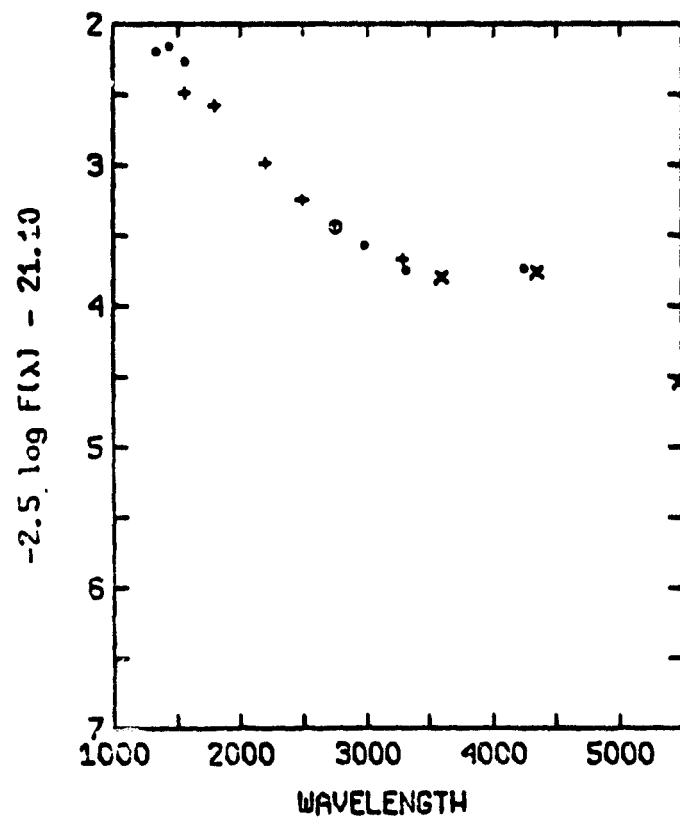
HD 21428 34 PER 85 V



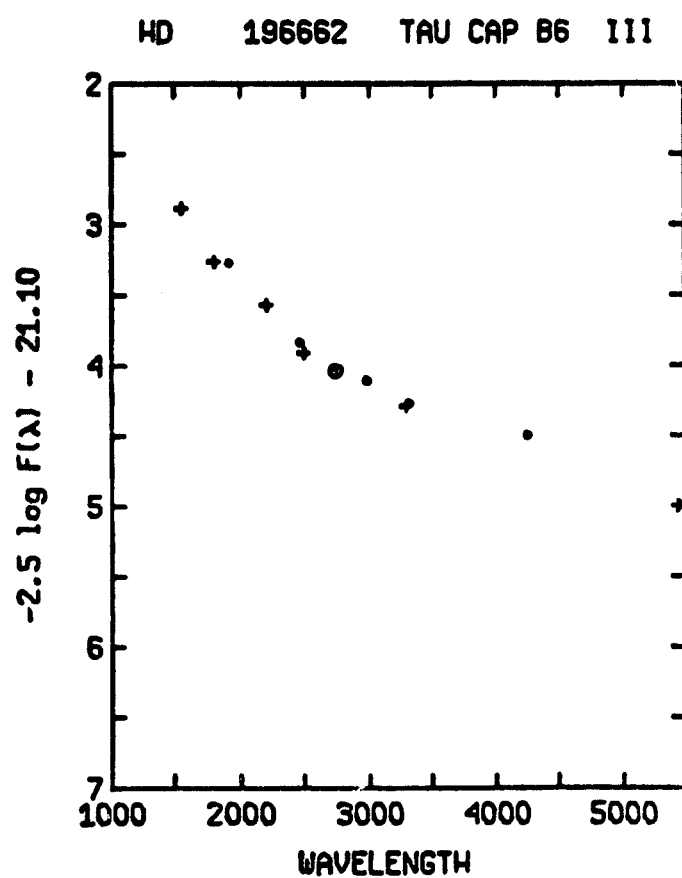
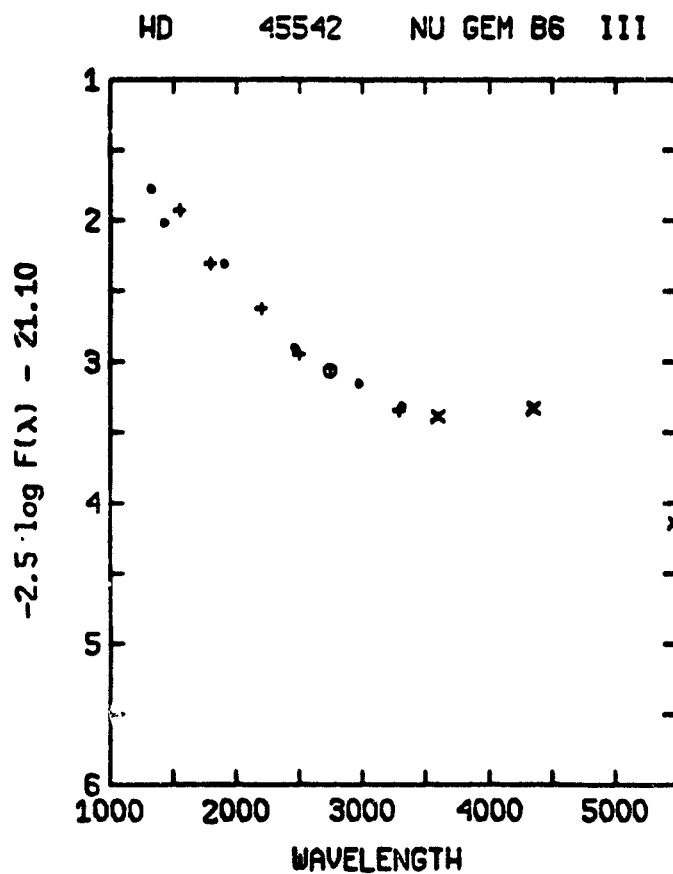
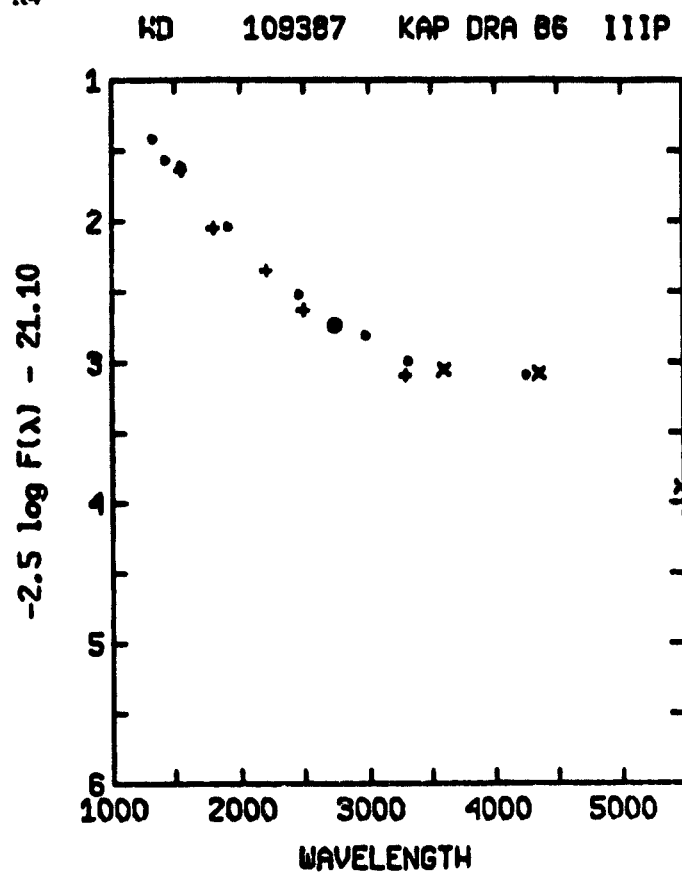
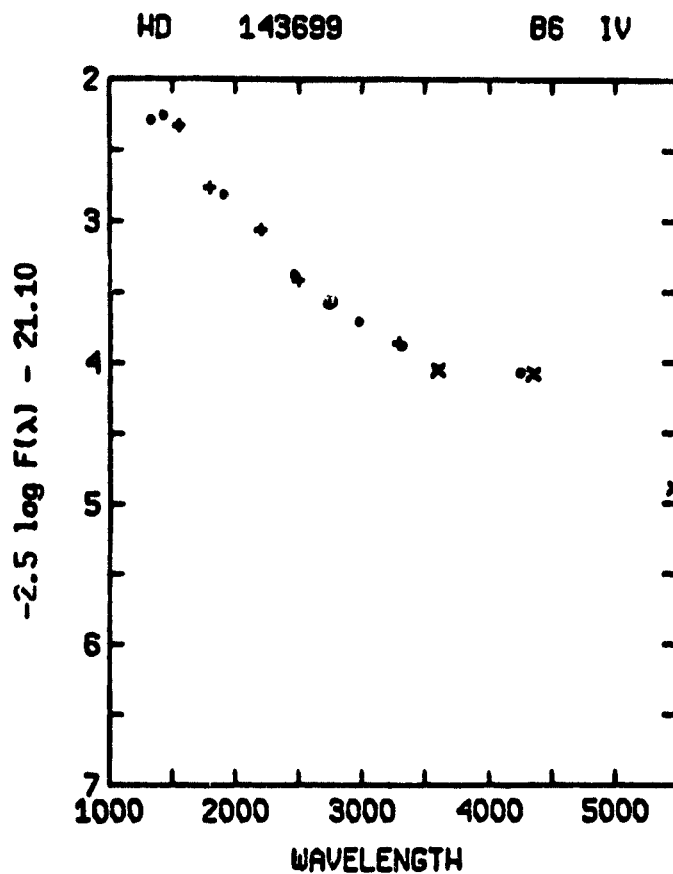
HD 22192 PSI PER 85 VE

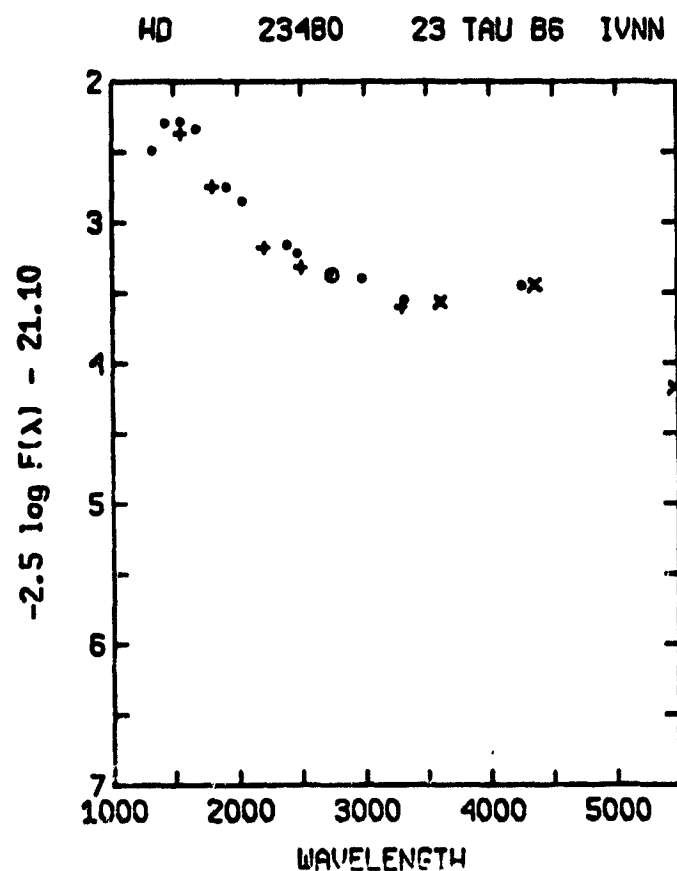
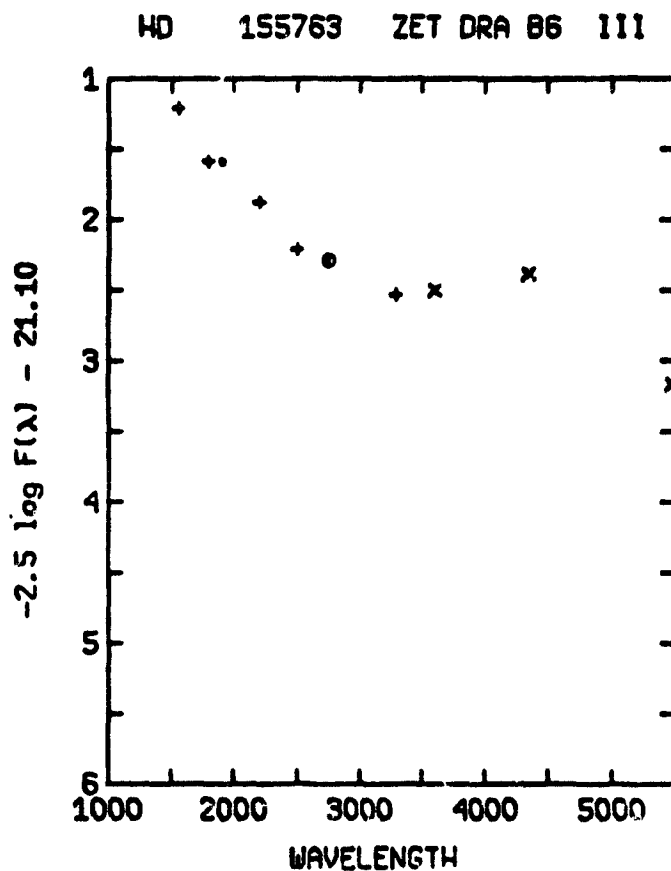
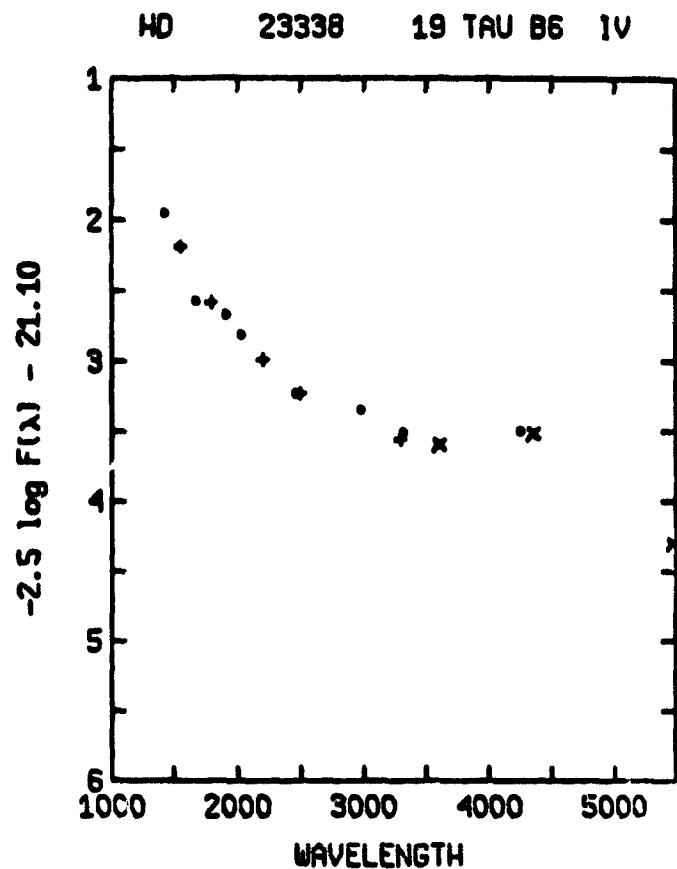
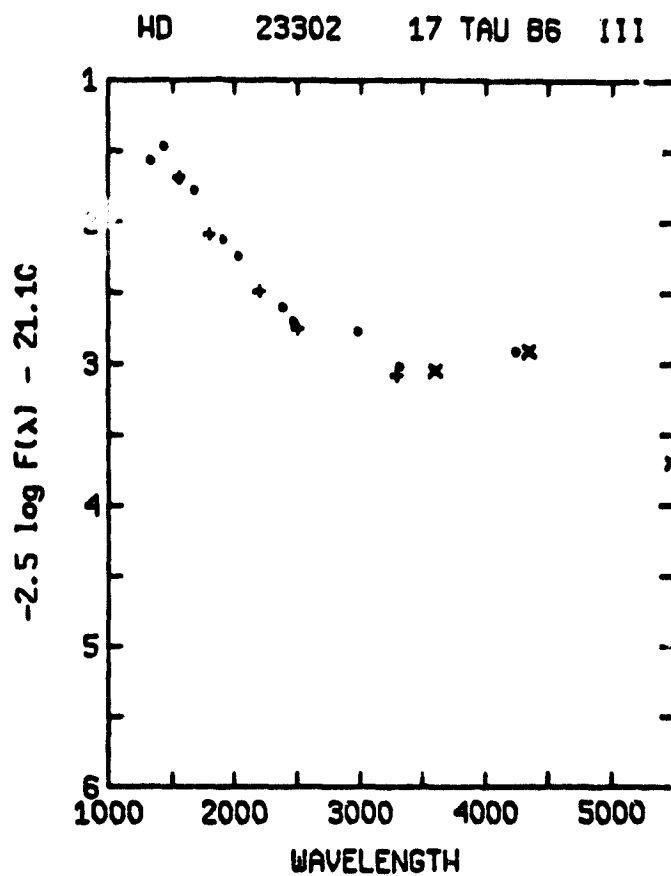


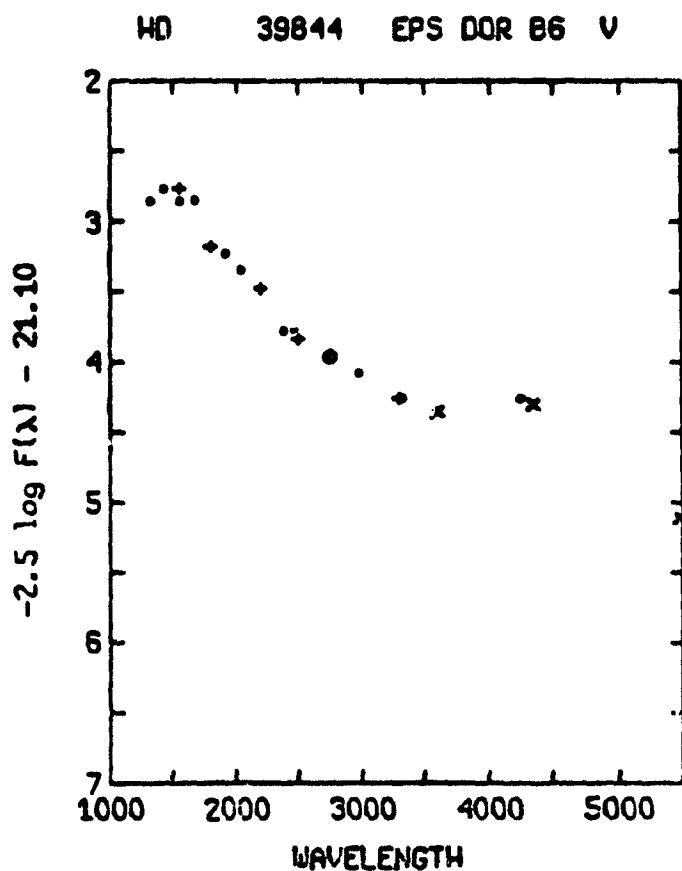
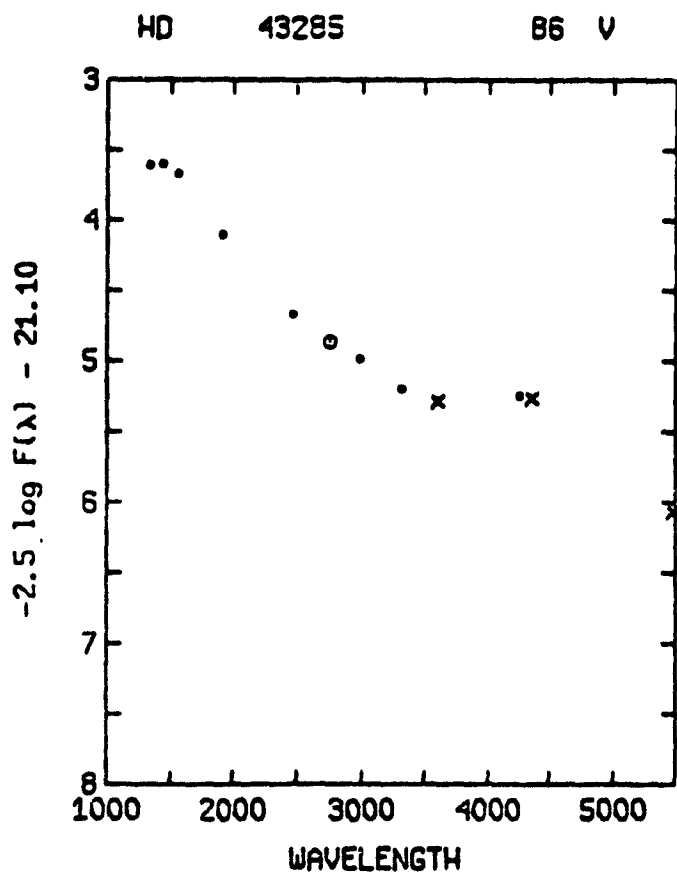
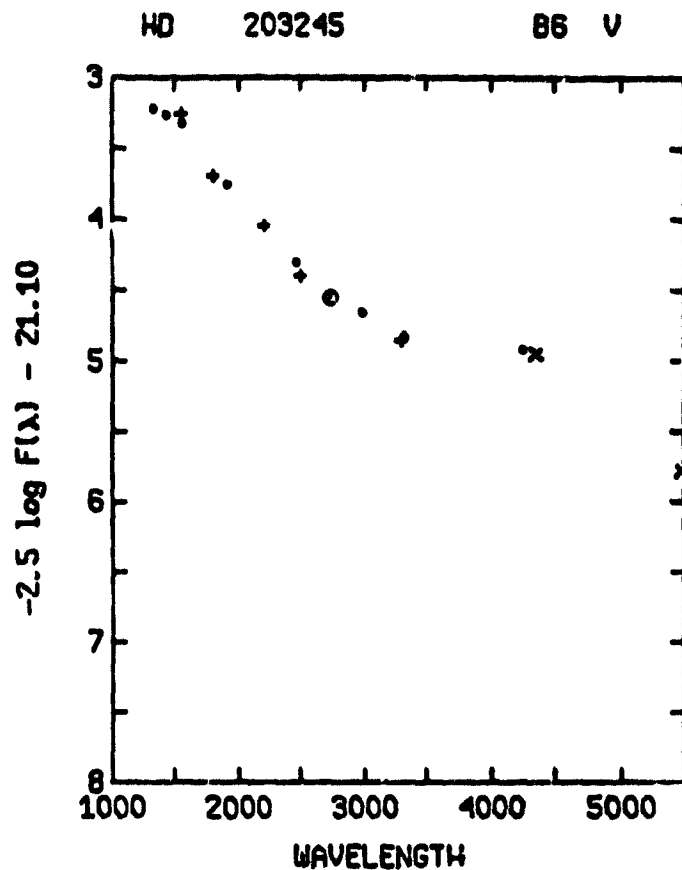
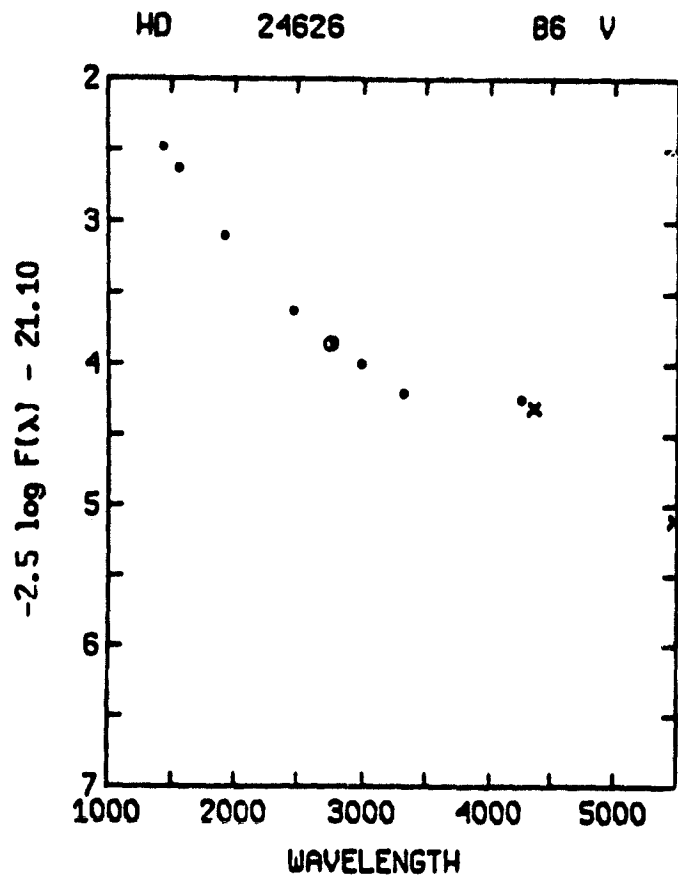
HD 192193 LAM CYG 85 V



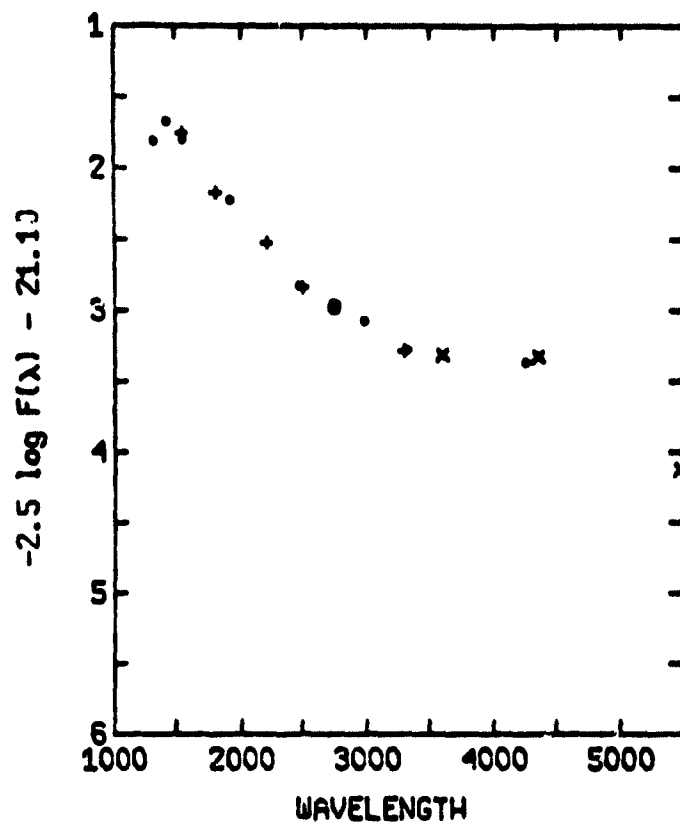
B0 III-IV stars
R1-R4



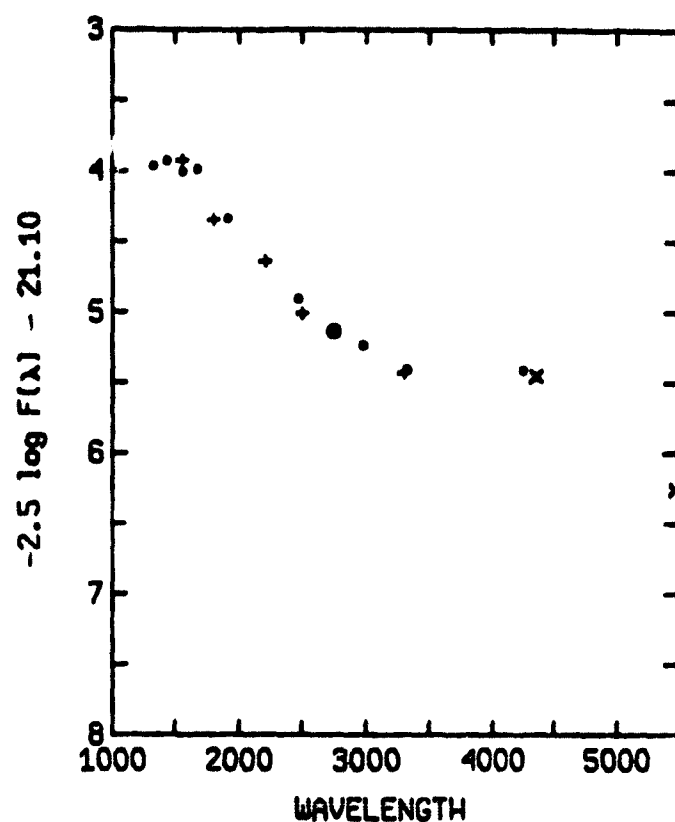




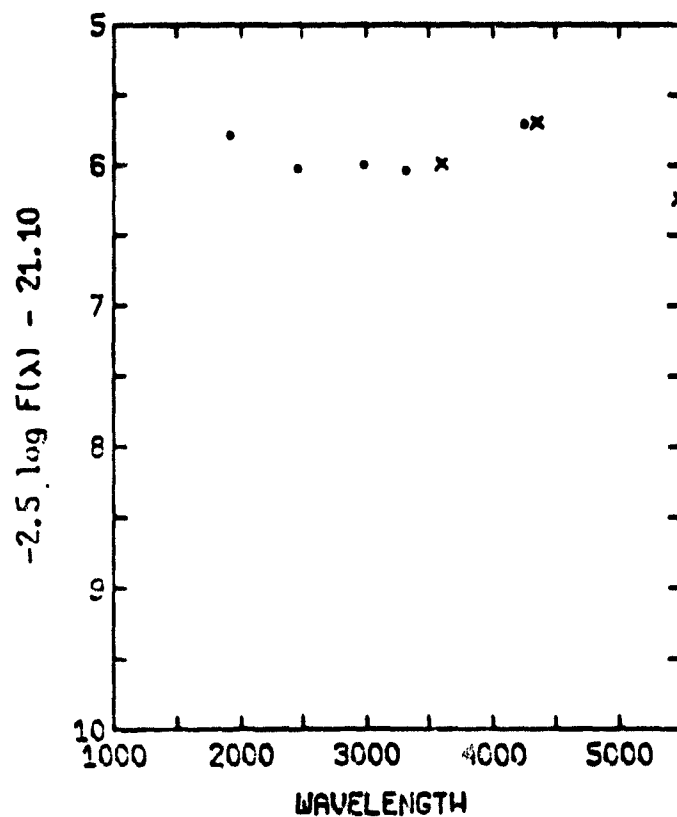
HD 138749 THT CR8 B6 VNN

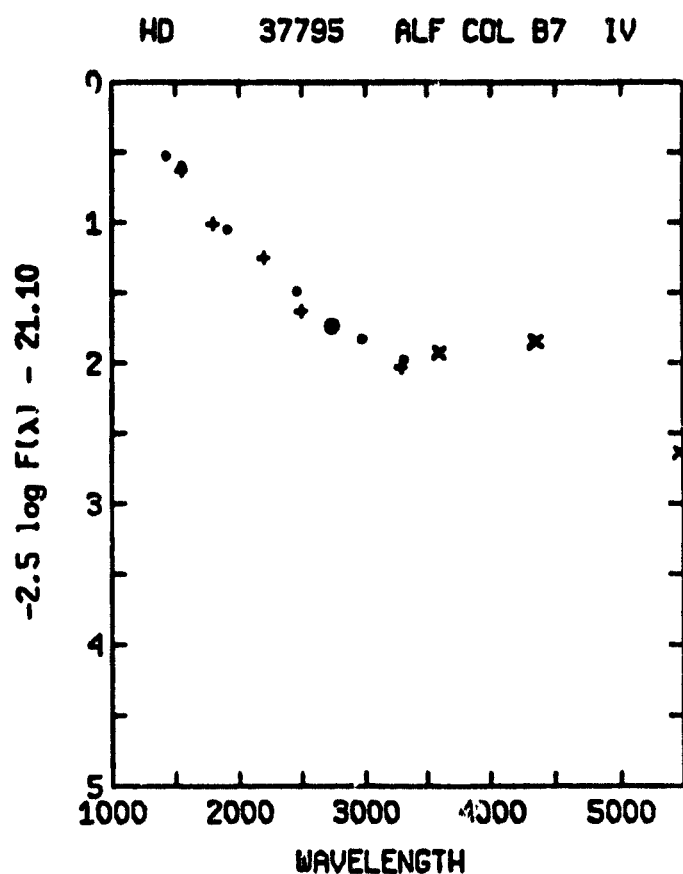
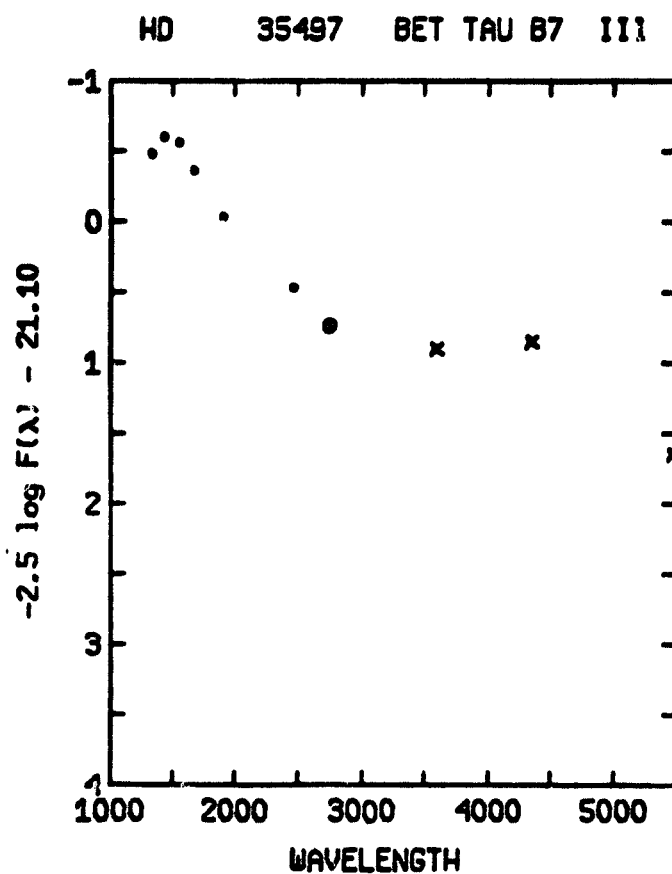
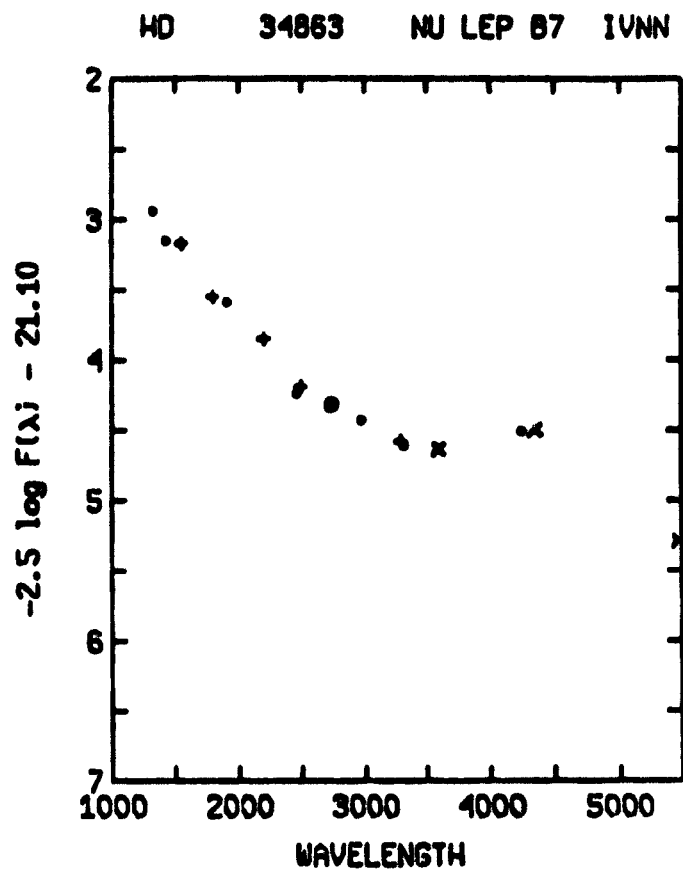
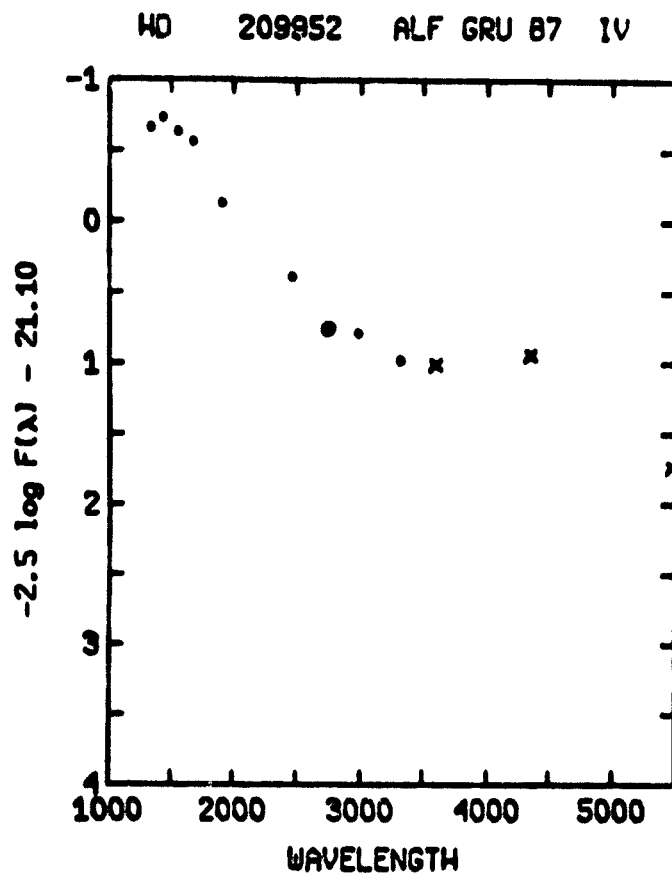


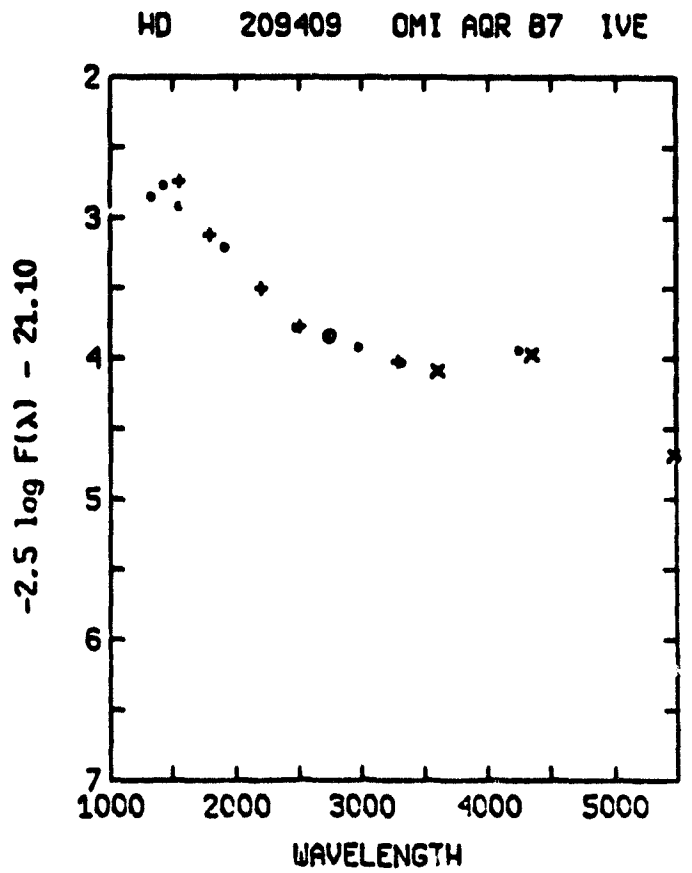
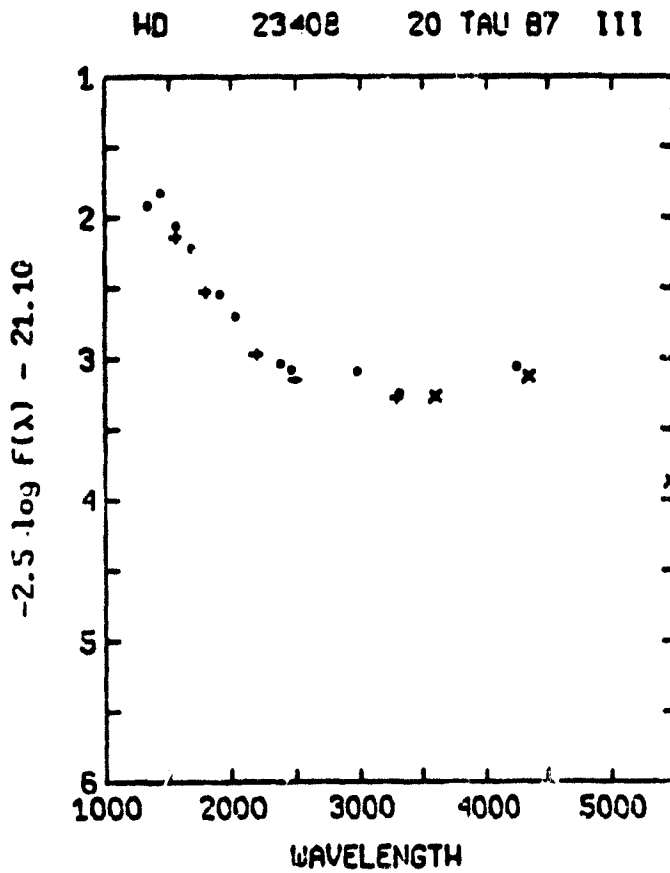
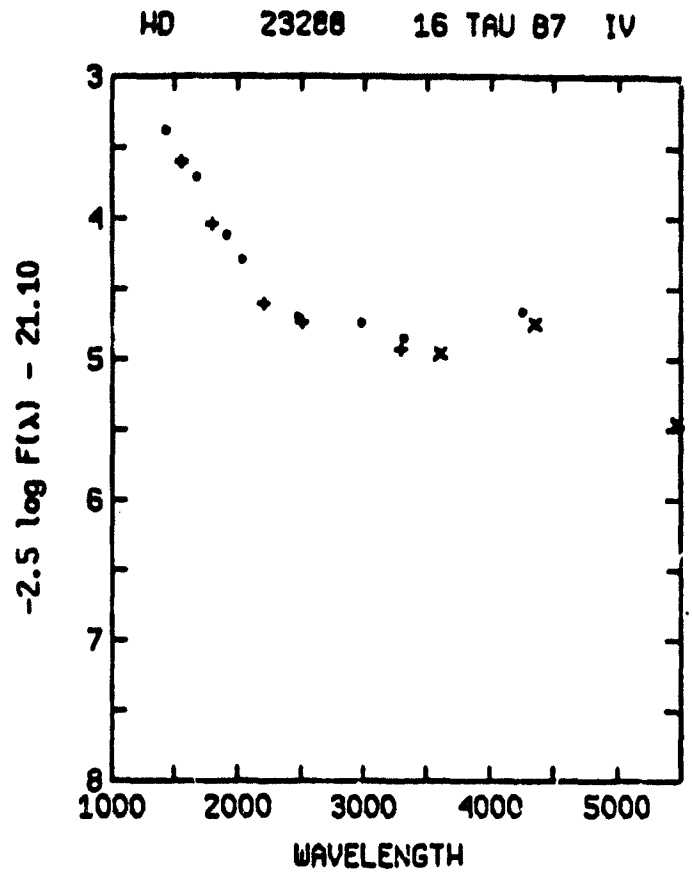
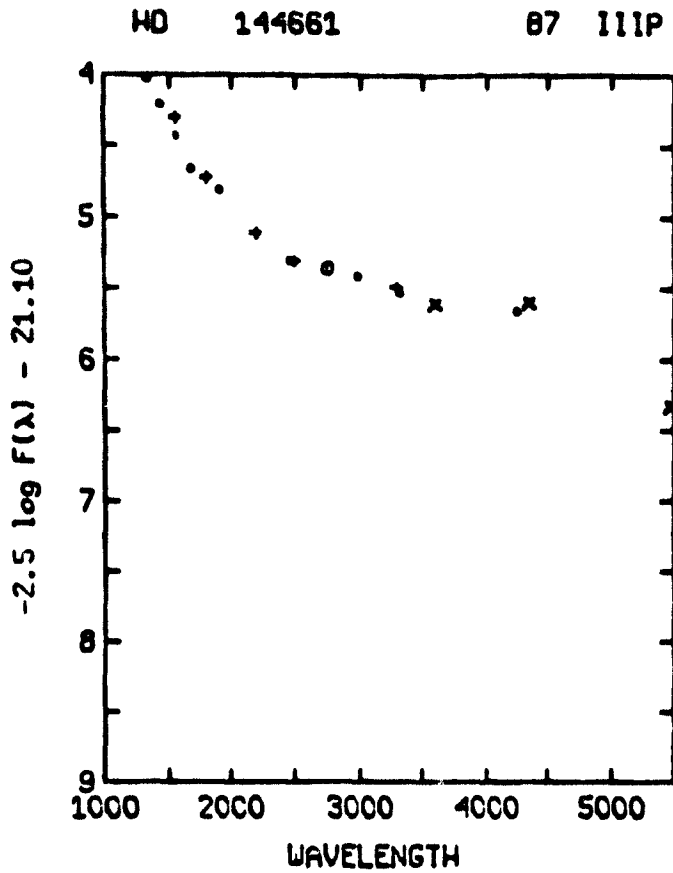
HD 45796 B6 V



HD 21455 B6 V

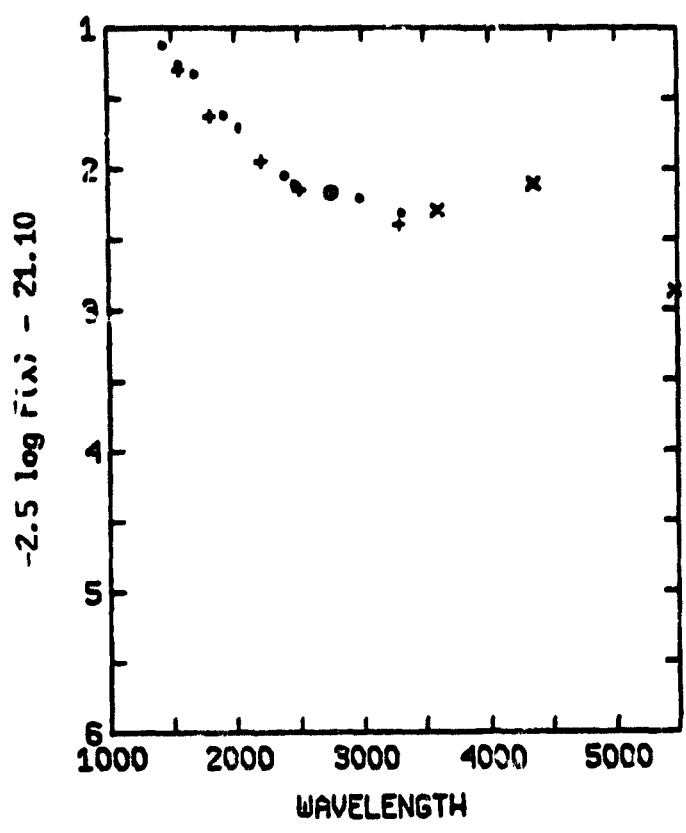






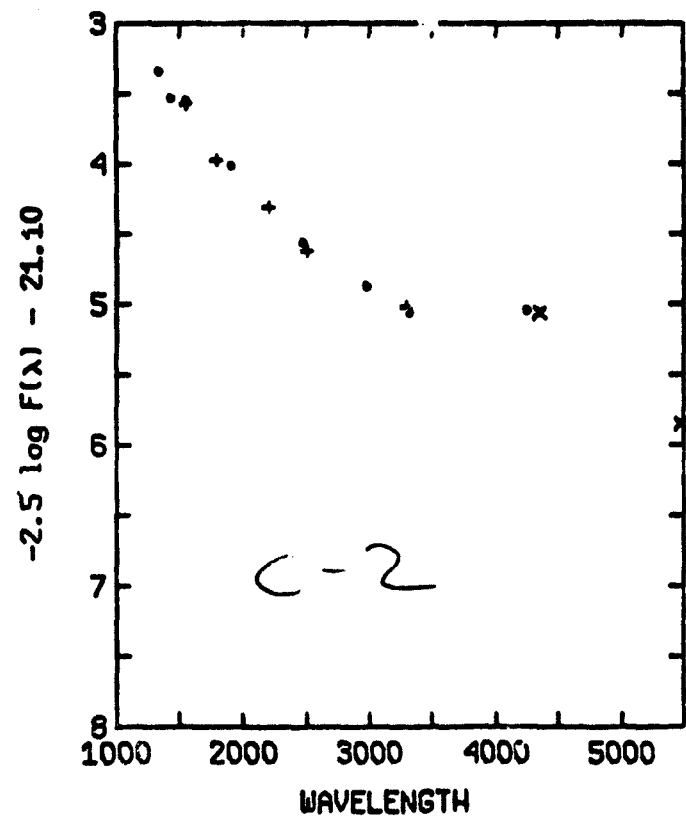
B7 III-IV stars
T9

HD 23630 ETA TAU B7 III

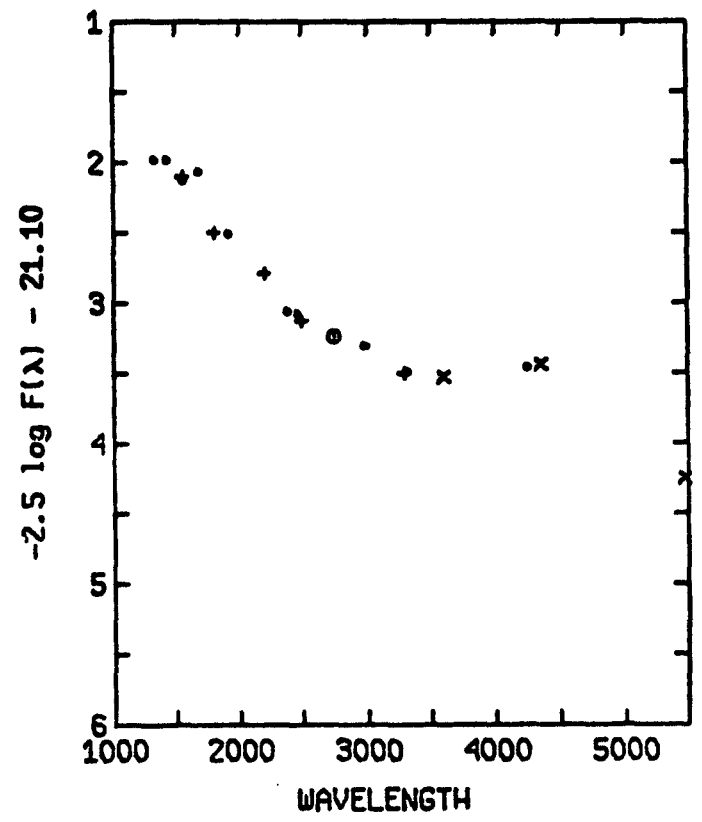


B7 V stars
U1-U2

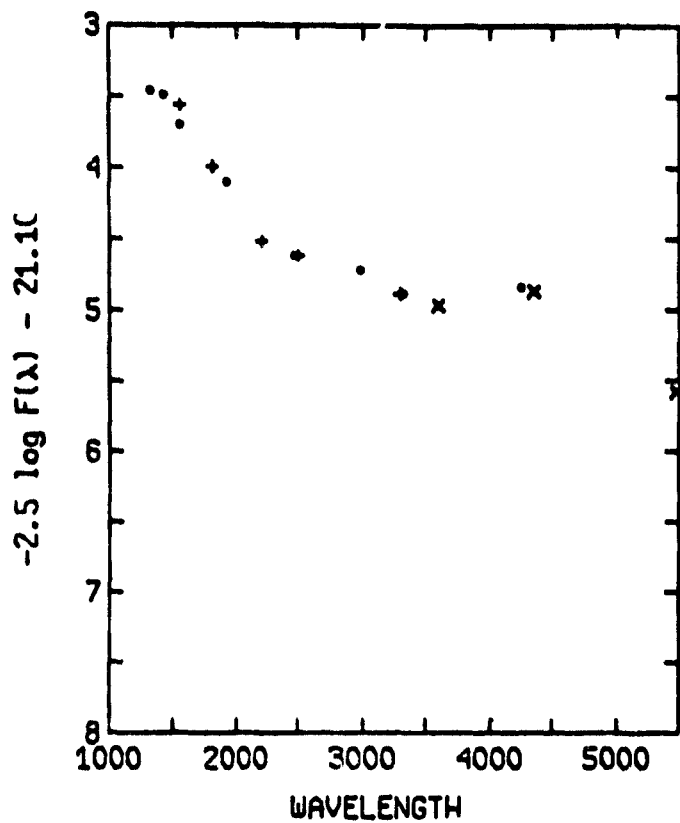
HD 133937 B7 V



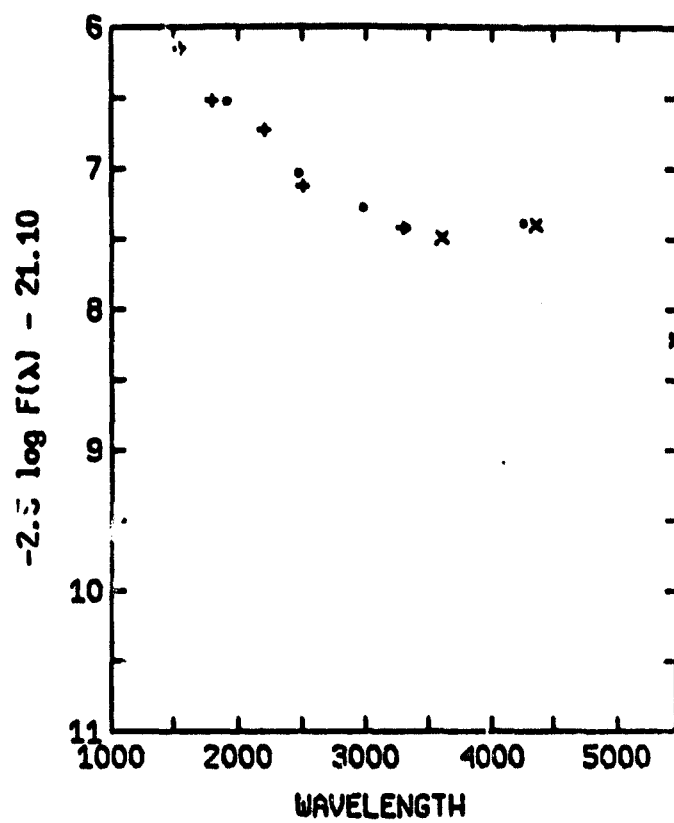
HD 17081 PI CET B7 V



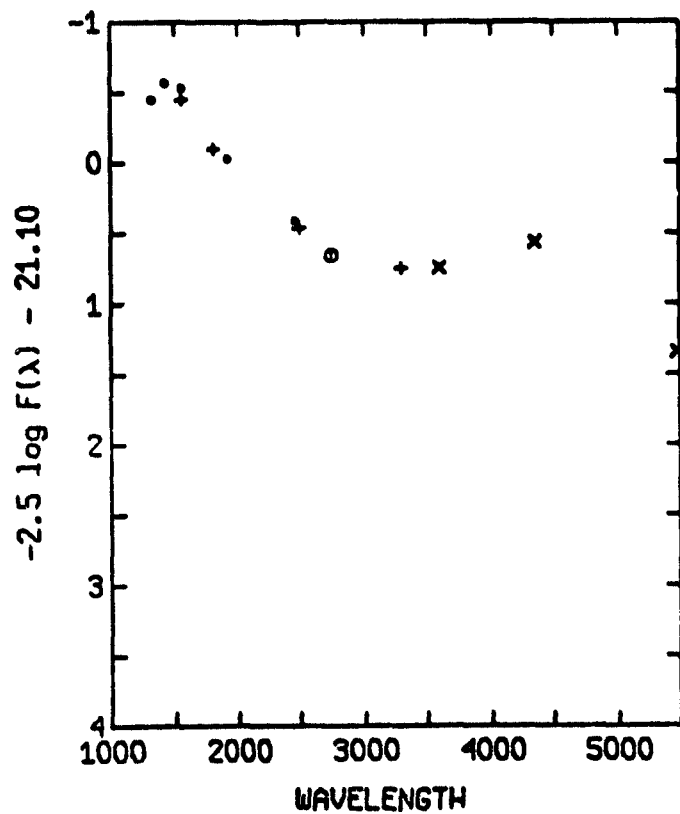
HD 21362 B7 VN

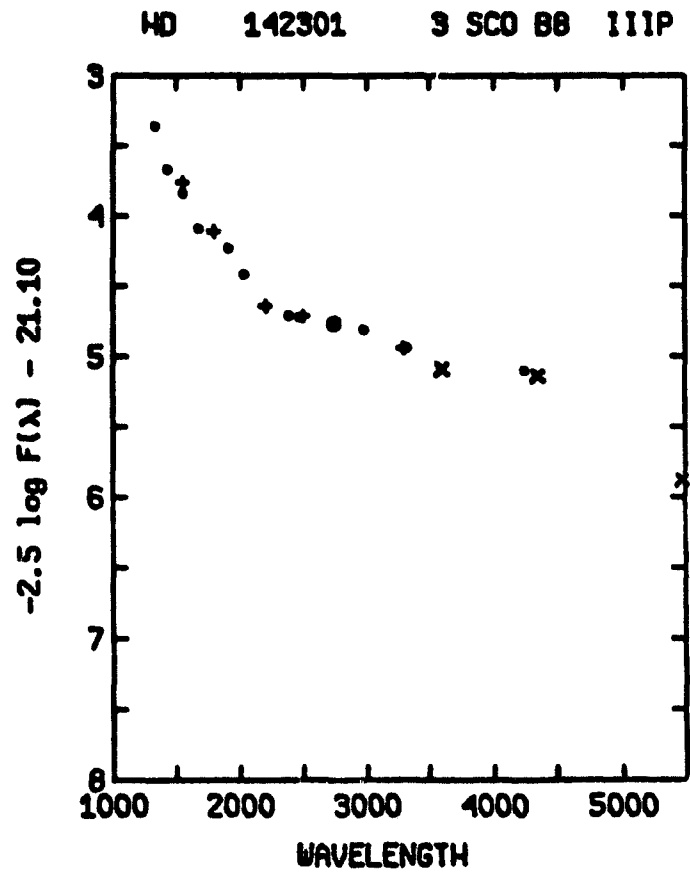
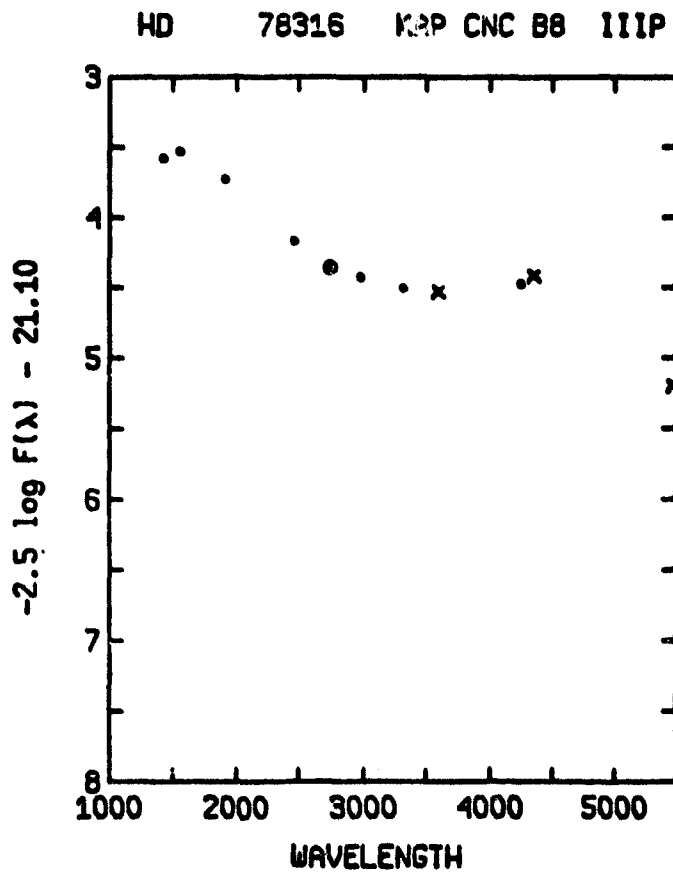
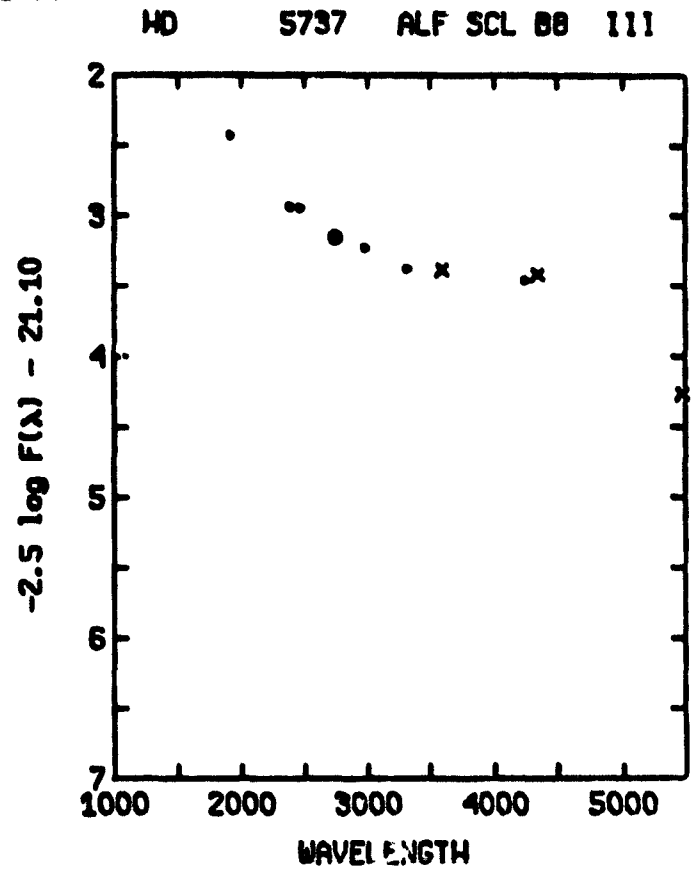
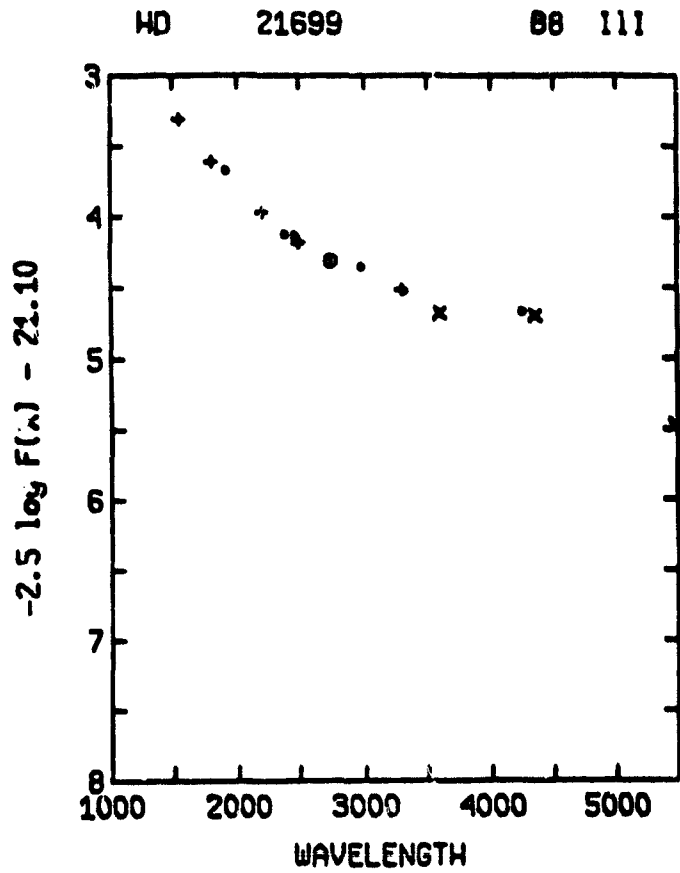


HD 106420 B7 V

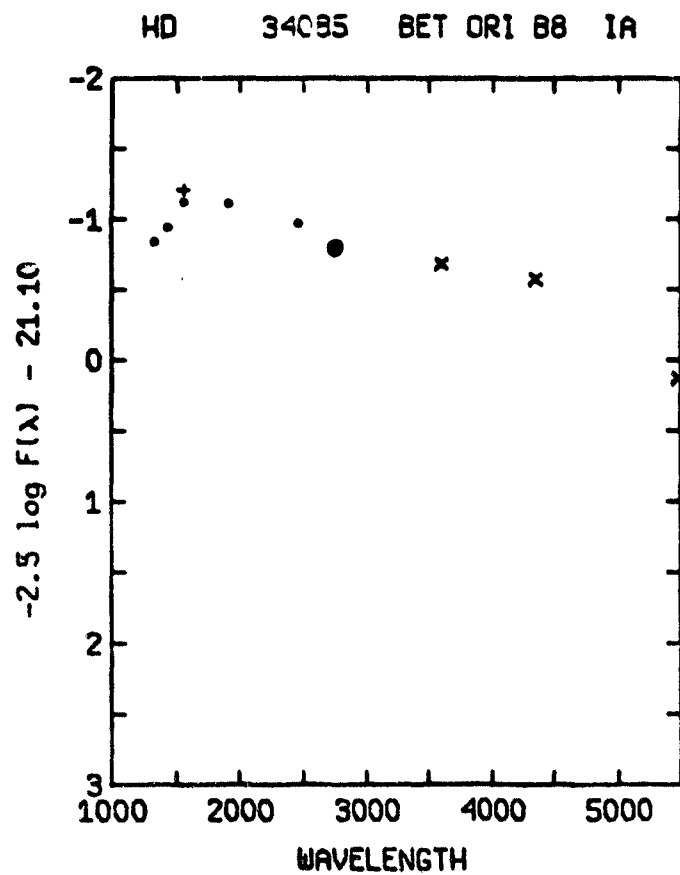
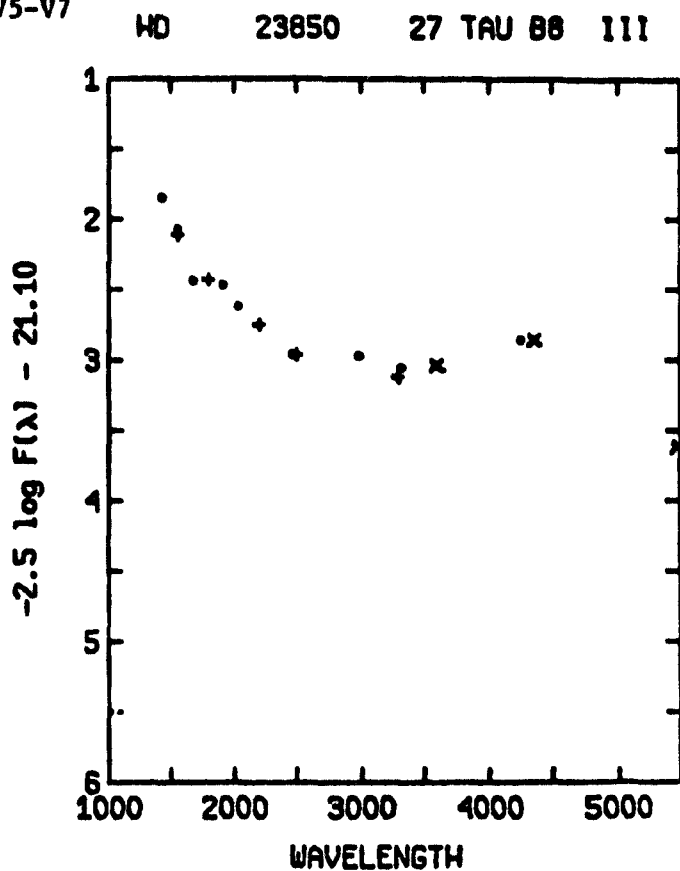
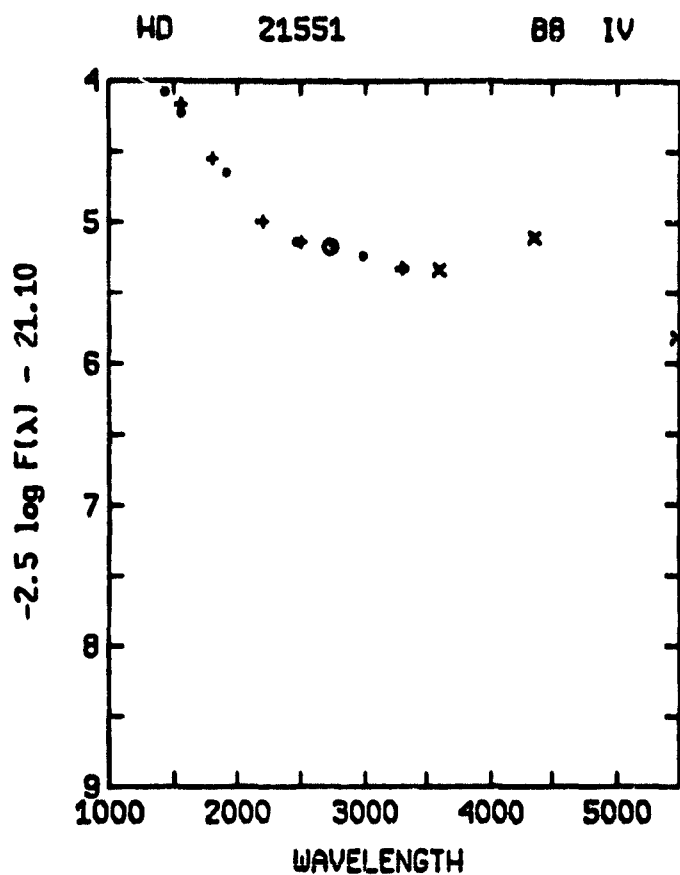


HD 87901 ALF LEO B7 V

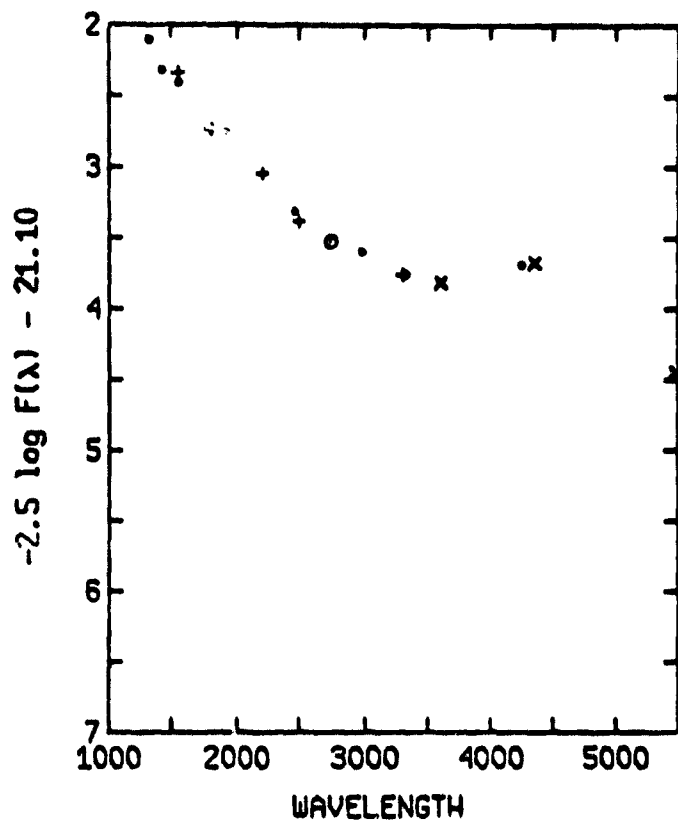




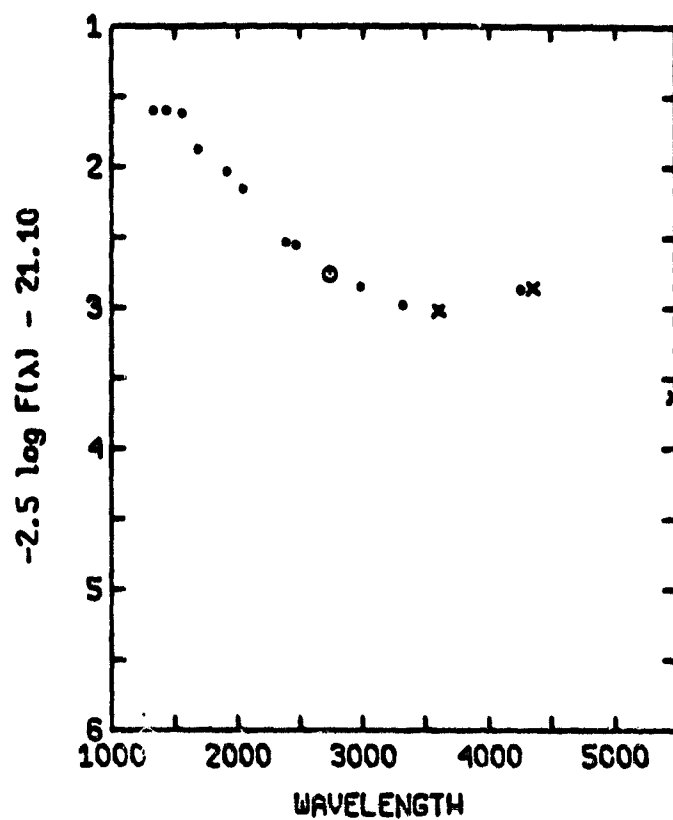
B8 I-IV stars
V5-V7



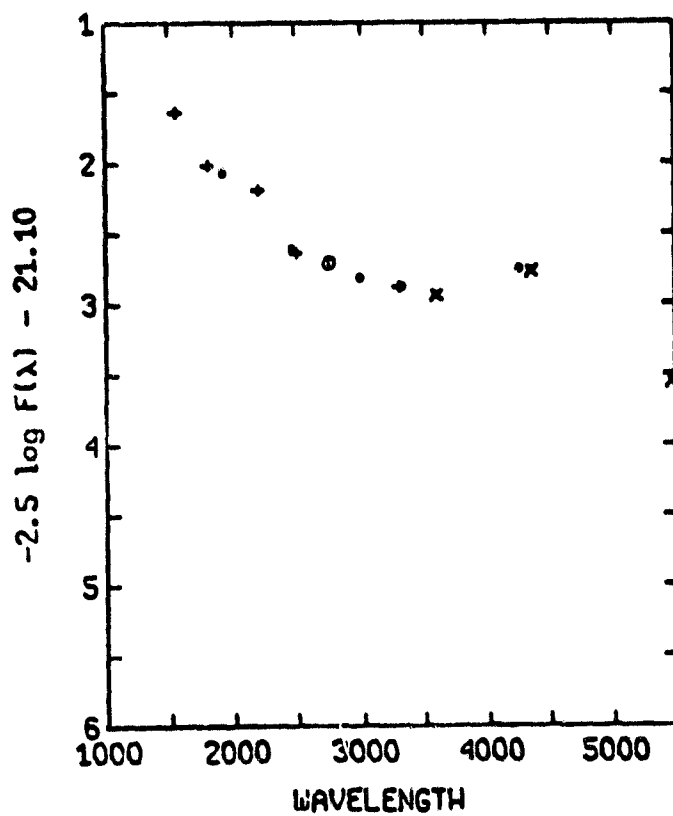
HD 33802 10T LEP B8 V



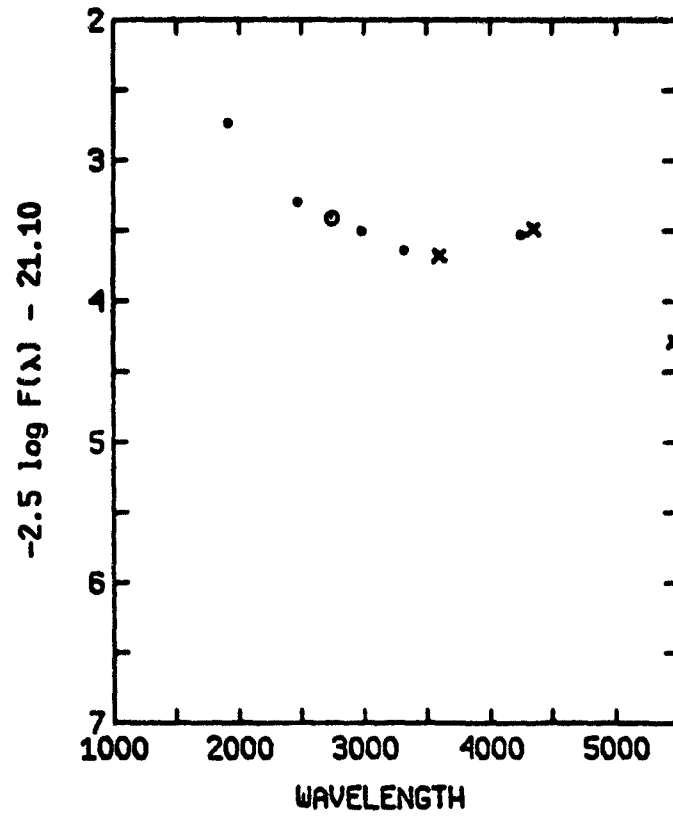
HD 17573 41 ARI B8 V



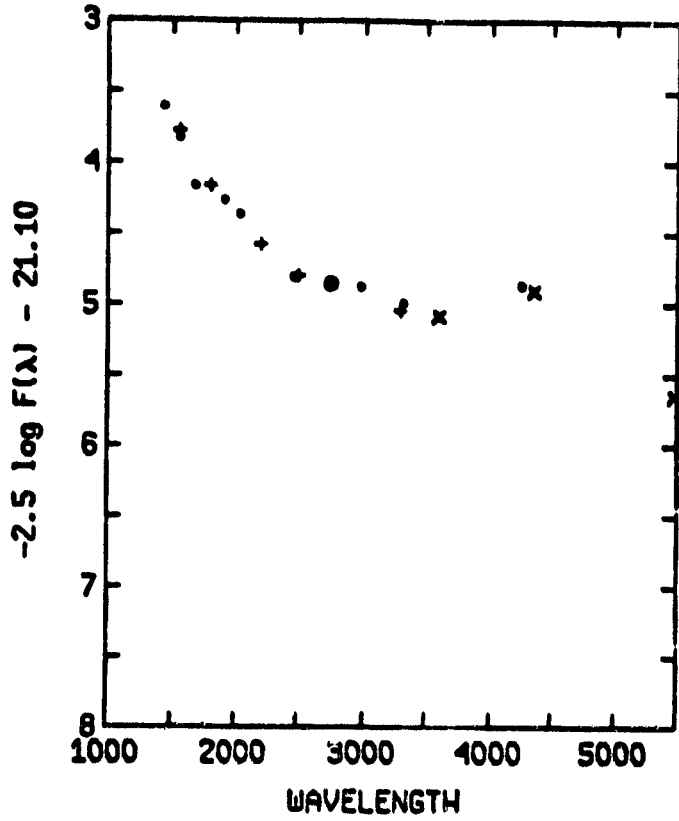
HD 27376 41 ERI B8.5V



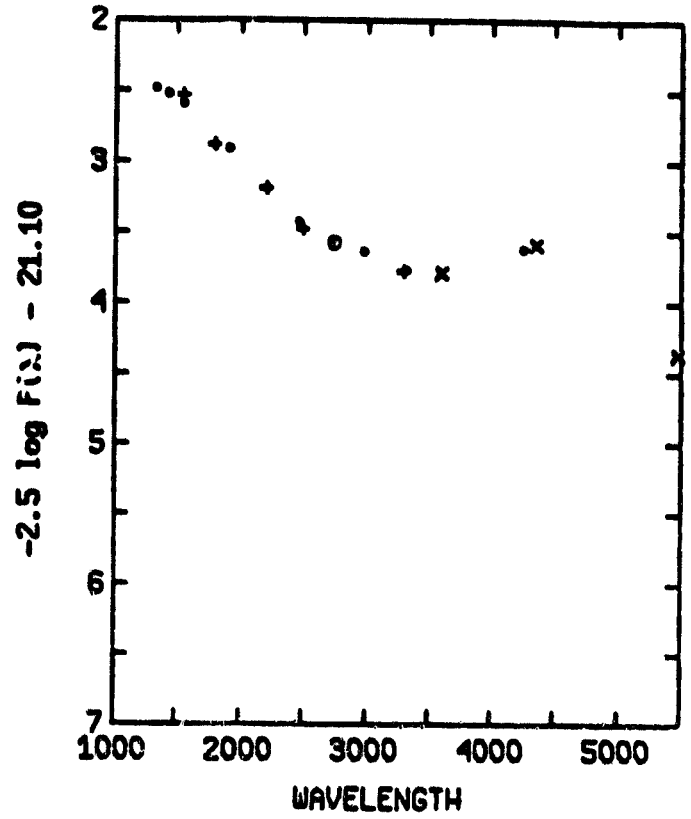
HD 22203 TAUSERI B8 V



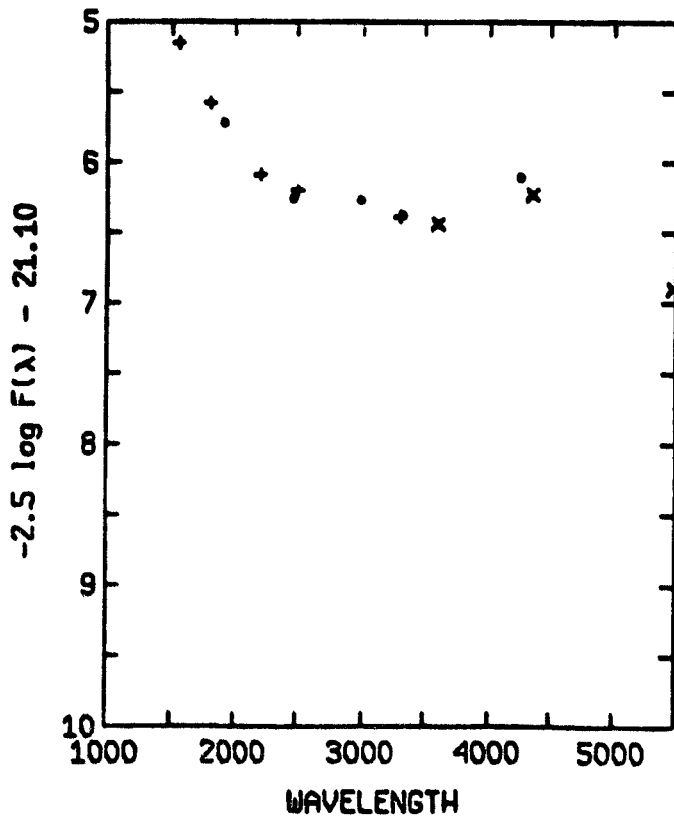
HD 23324 18 TAU B8 V



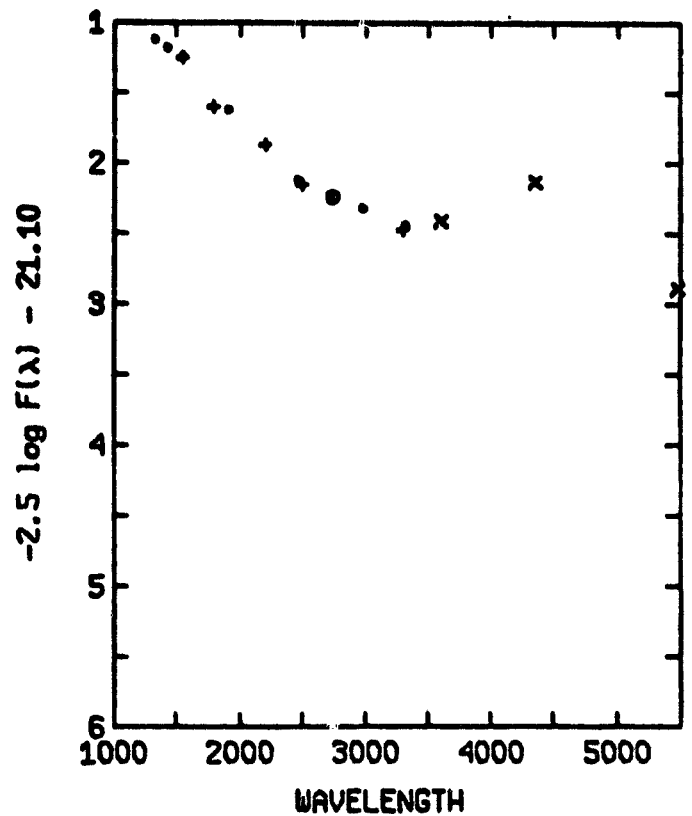
HD 33949 KAP LEP B8 V

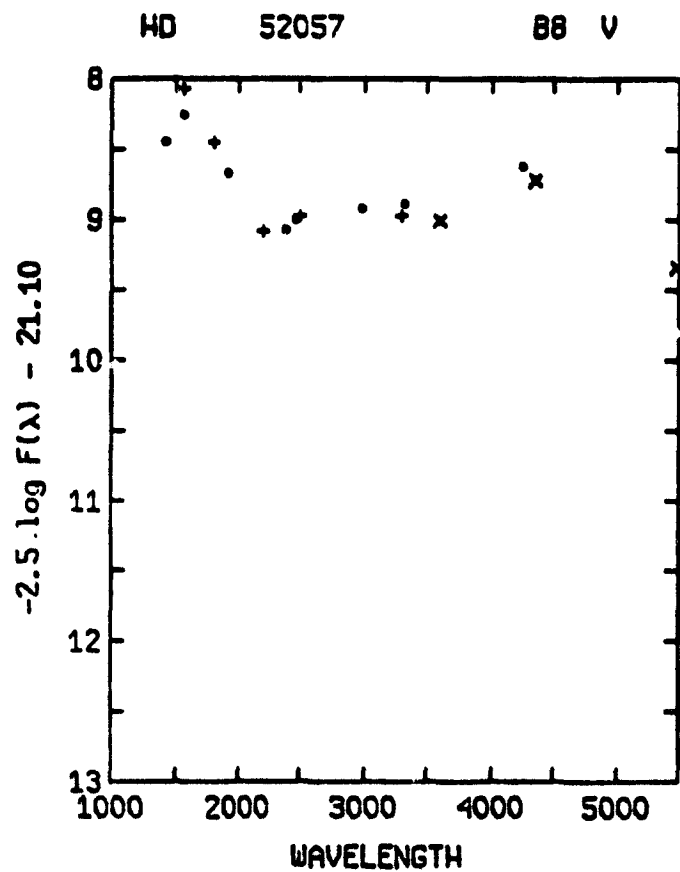
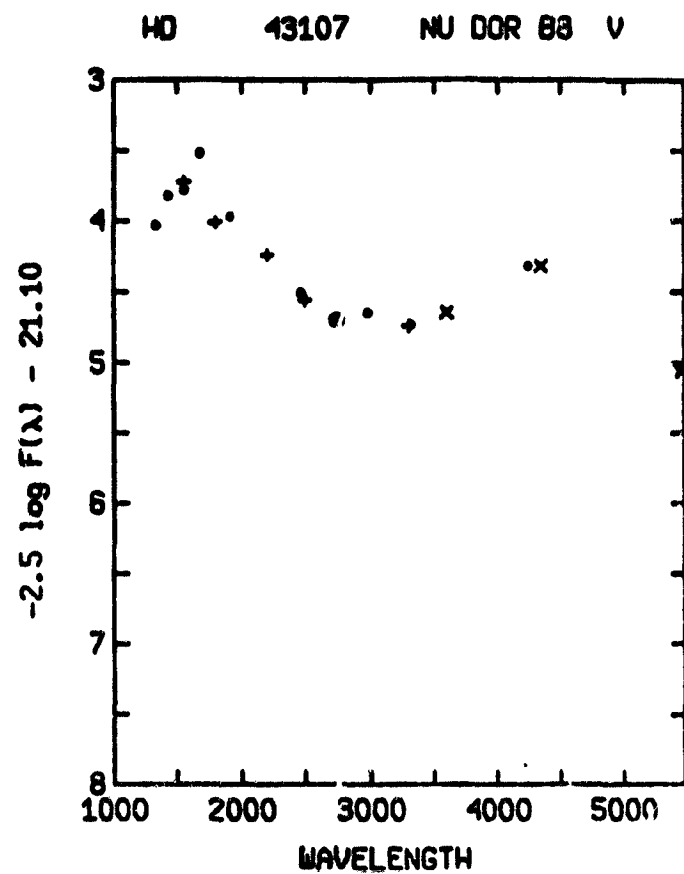
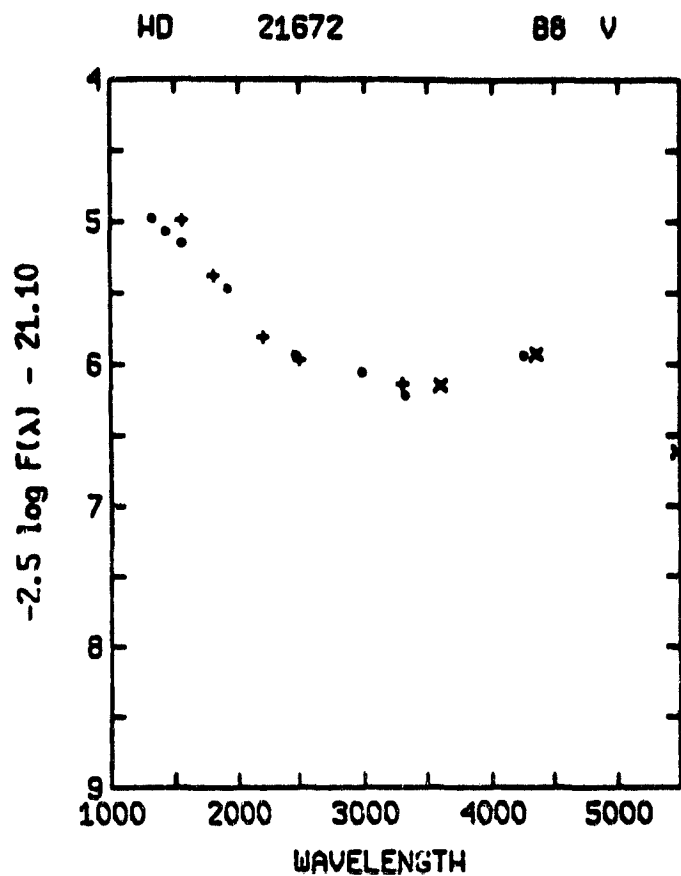


HD 22136 B8 V

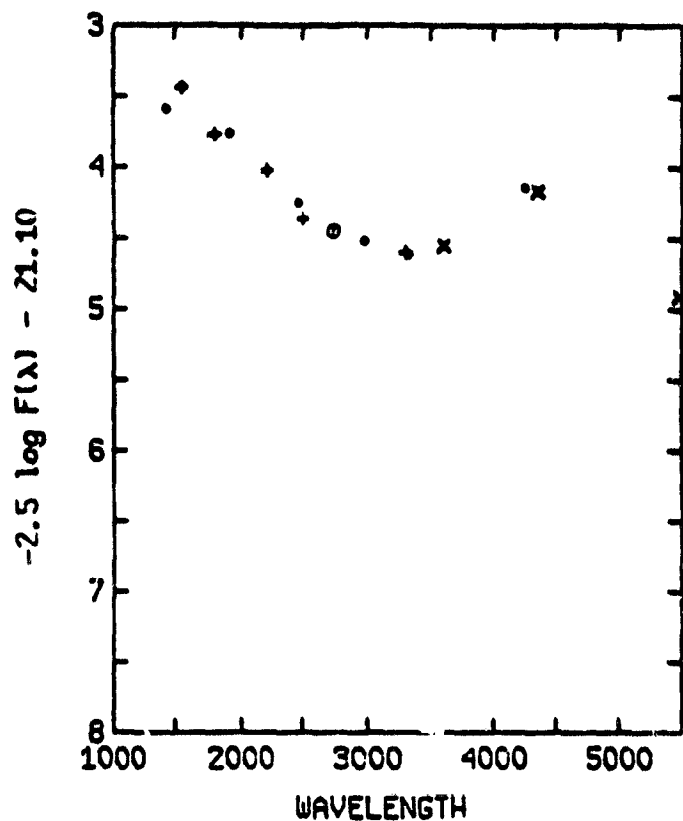


HD 58715 BET CMI B8 V

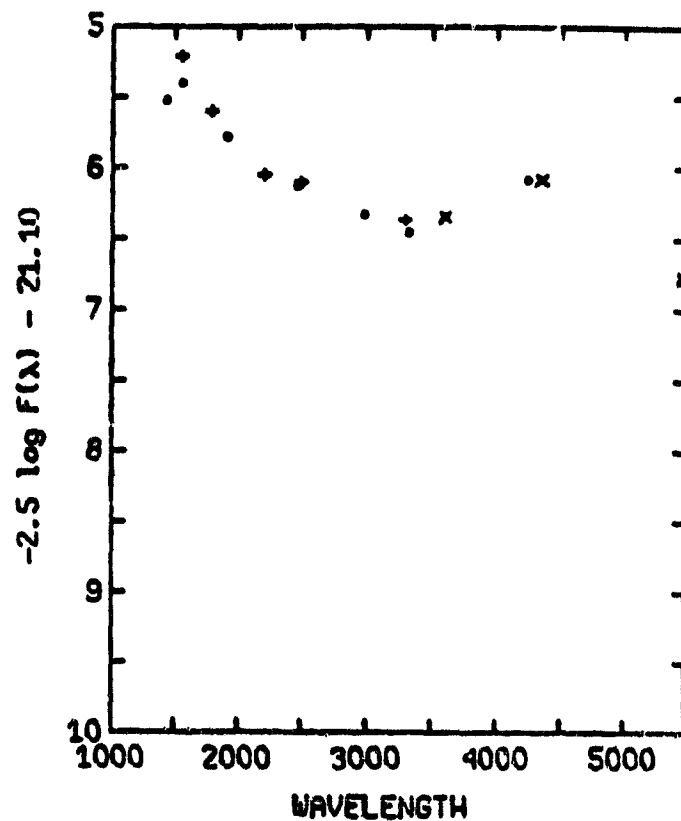




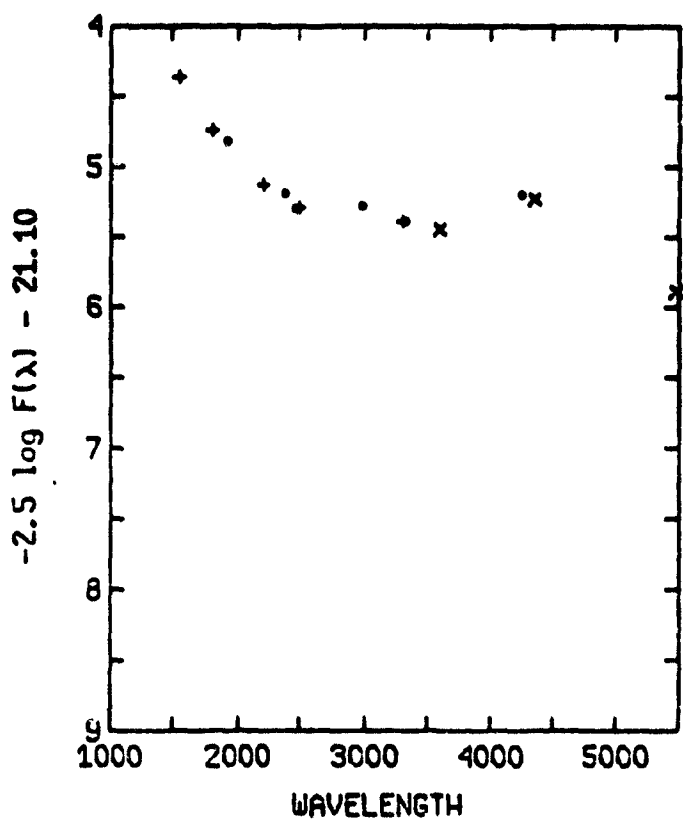
HD 38899 134 TAU B9 IV



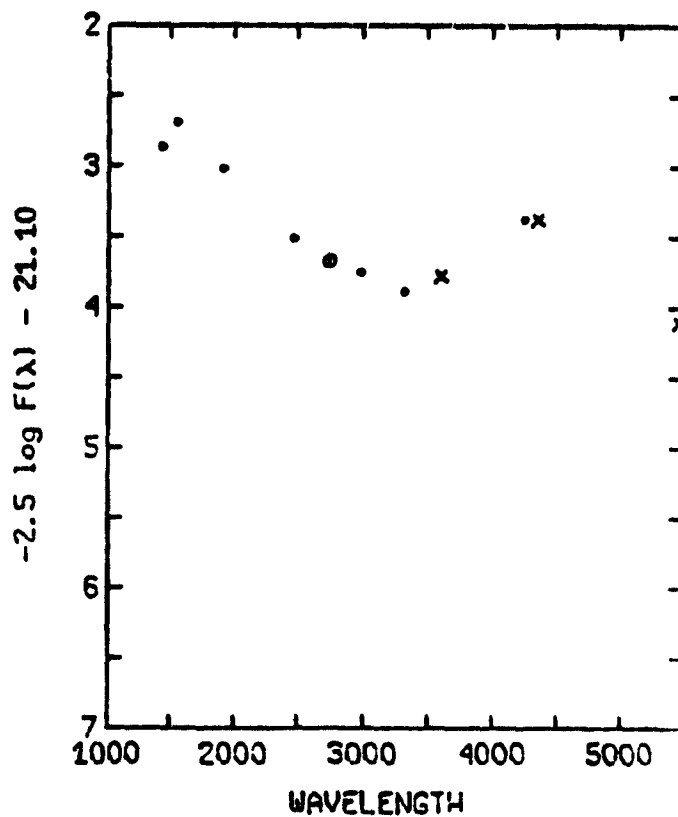
HD 21641 B9 V

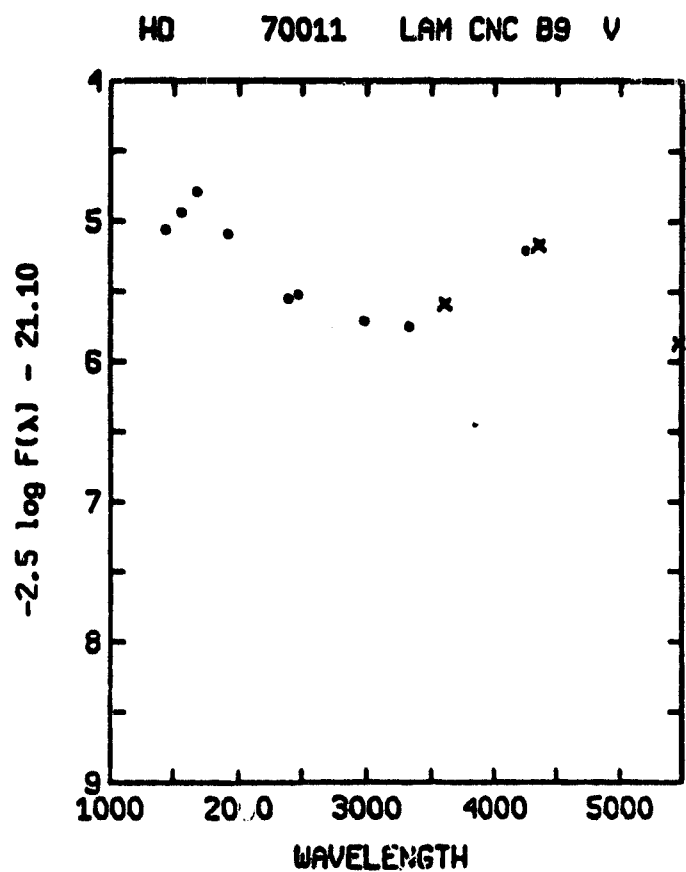
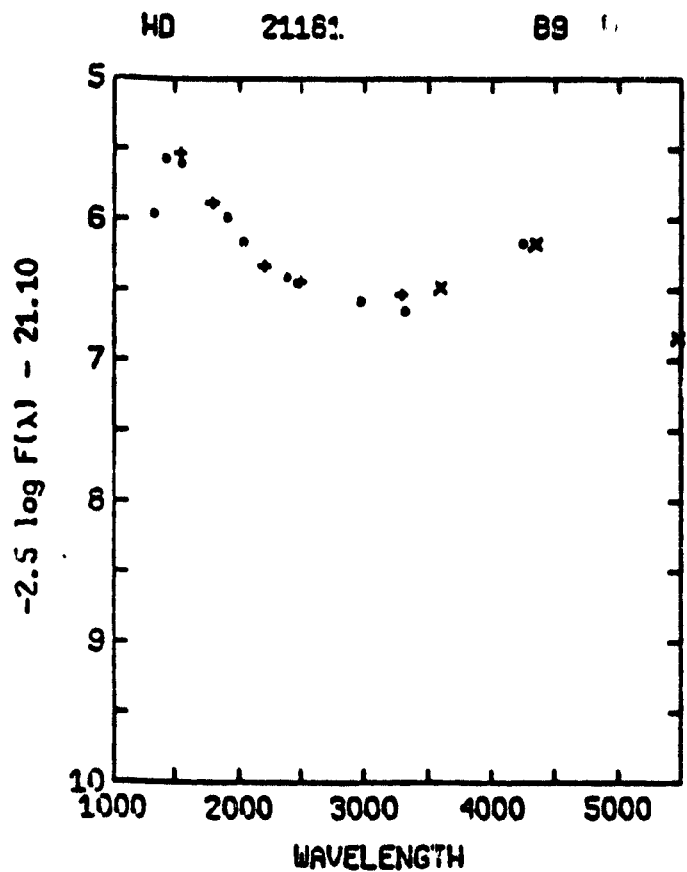
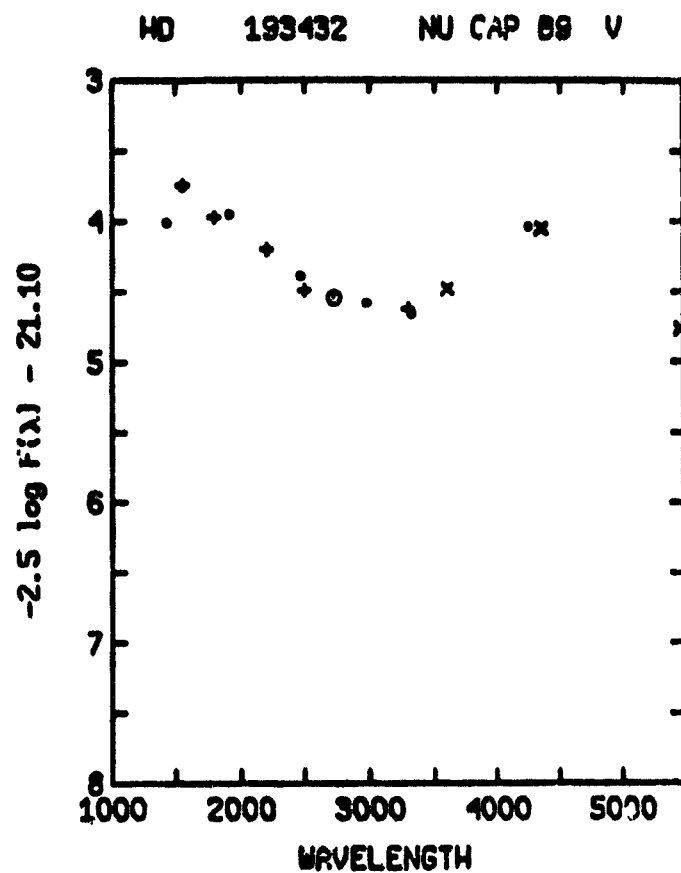
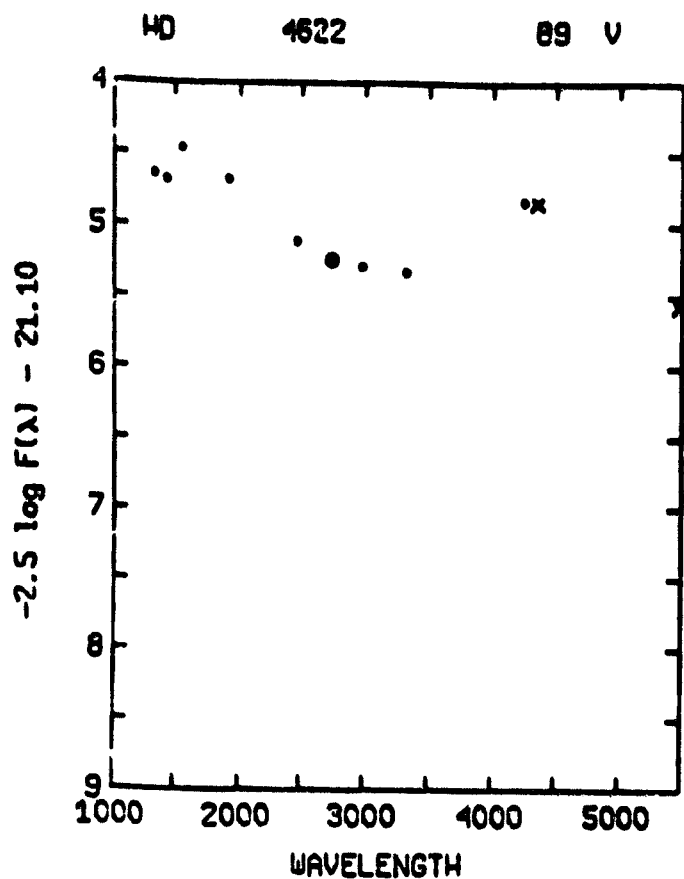


HD 144844 B9 V

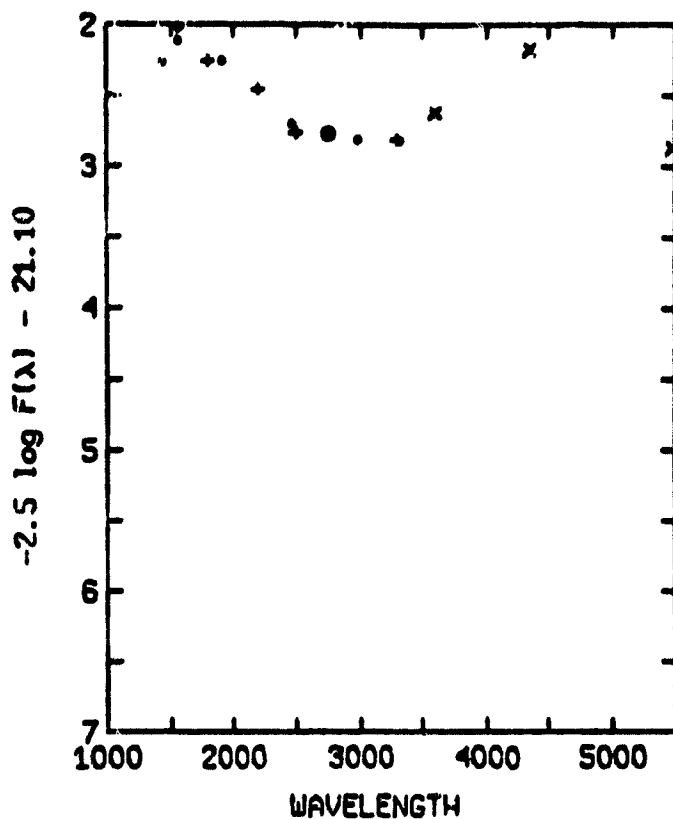


HD 16978 EPS. HYI B9 III

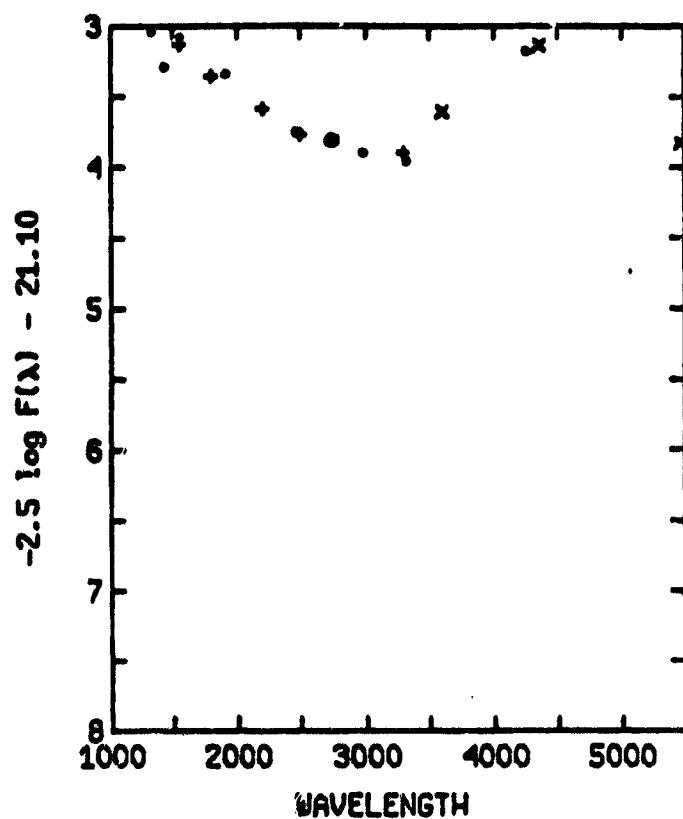




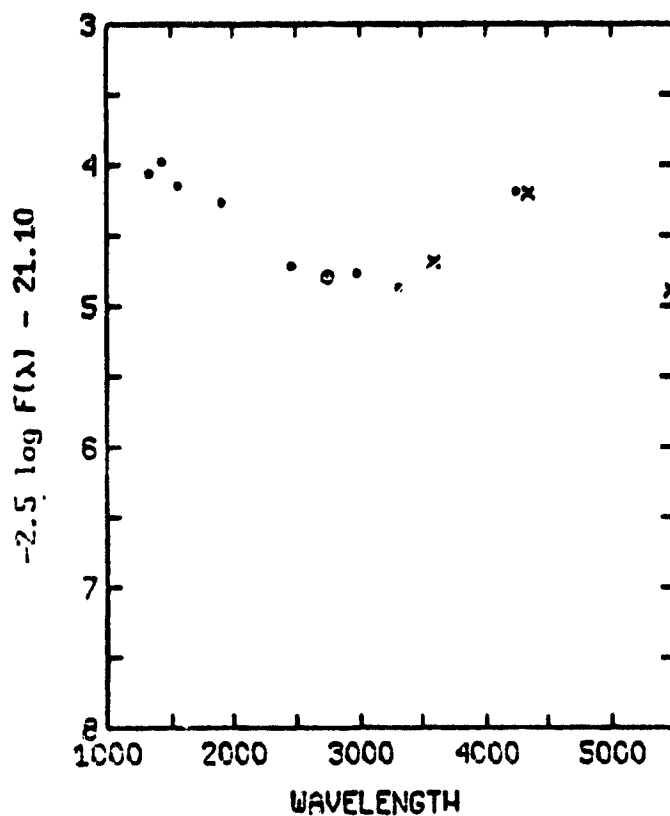
HD 186882 DEL CYG B9.5III



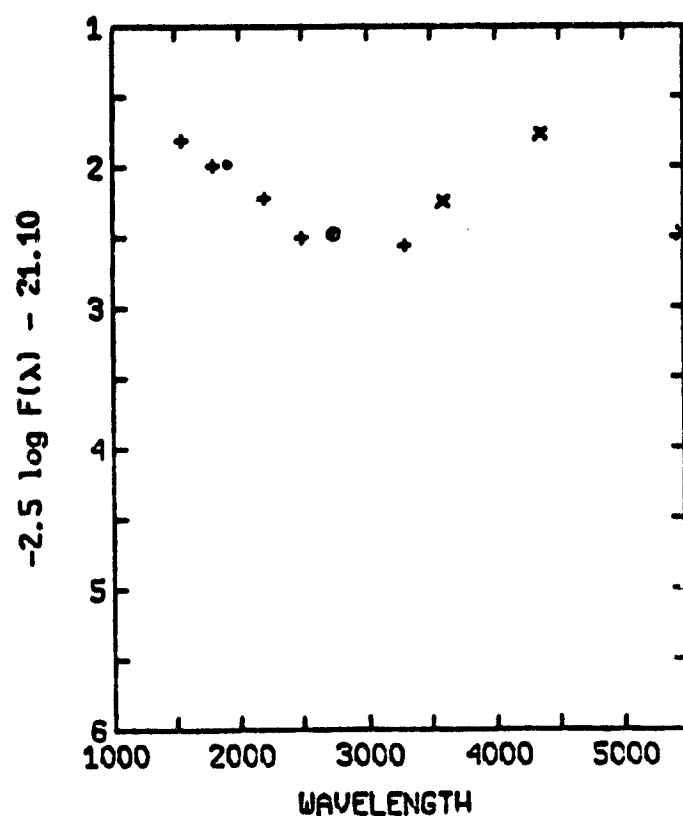
HD 166014 OMI HER B9 V

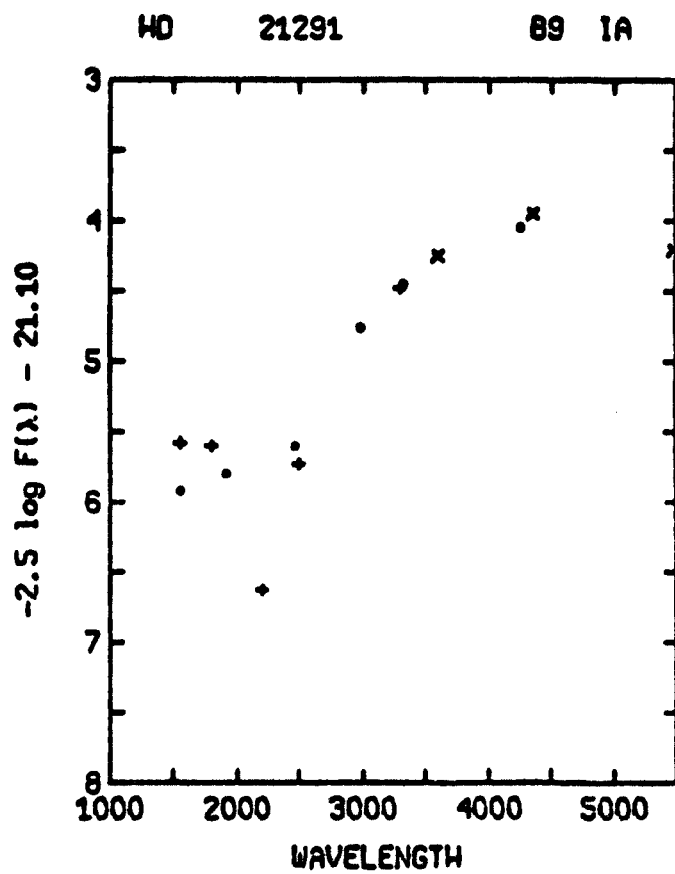
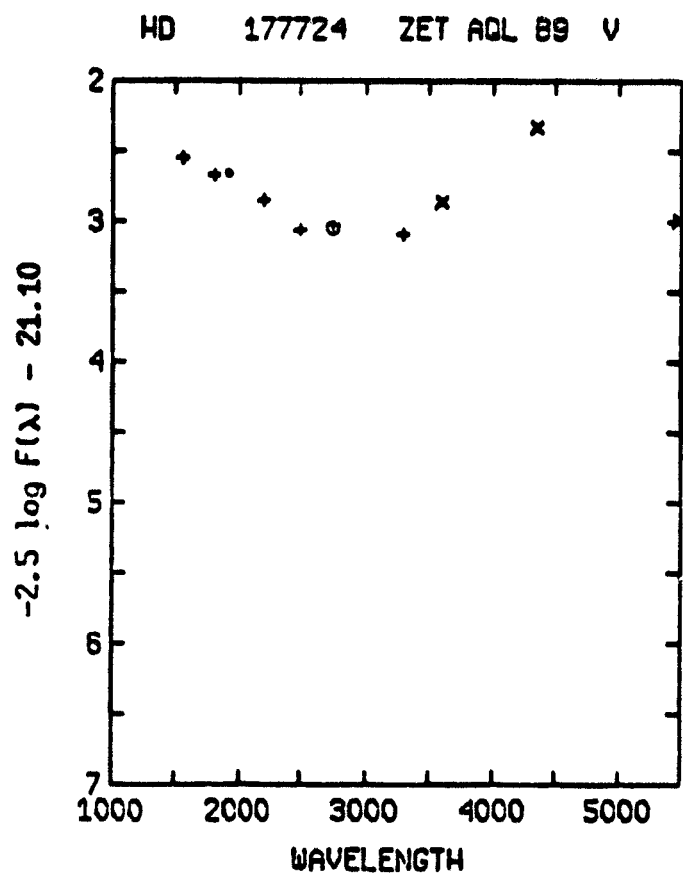
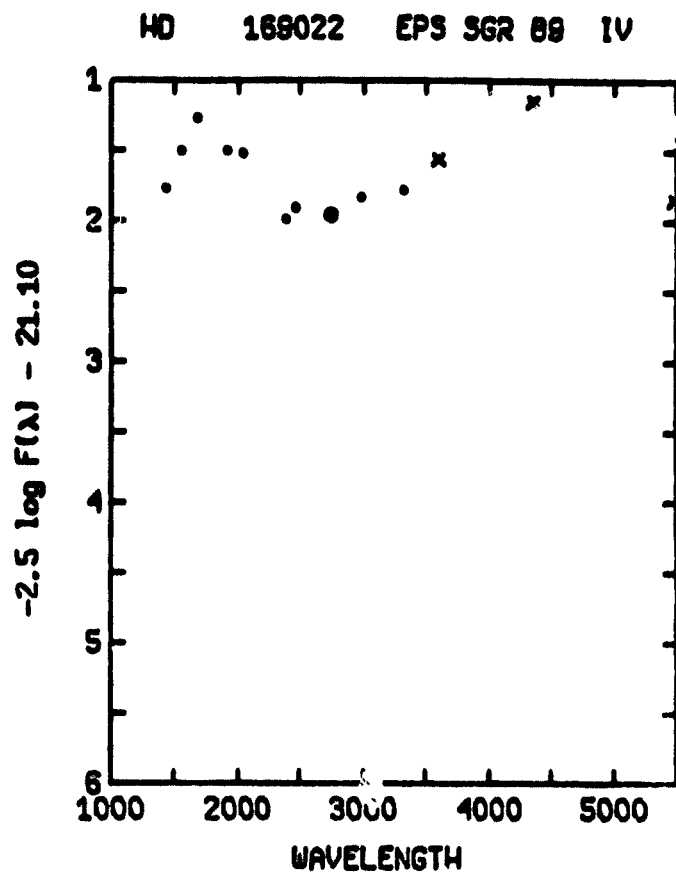
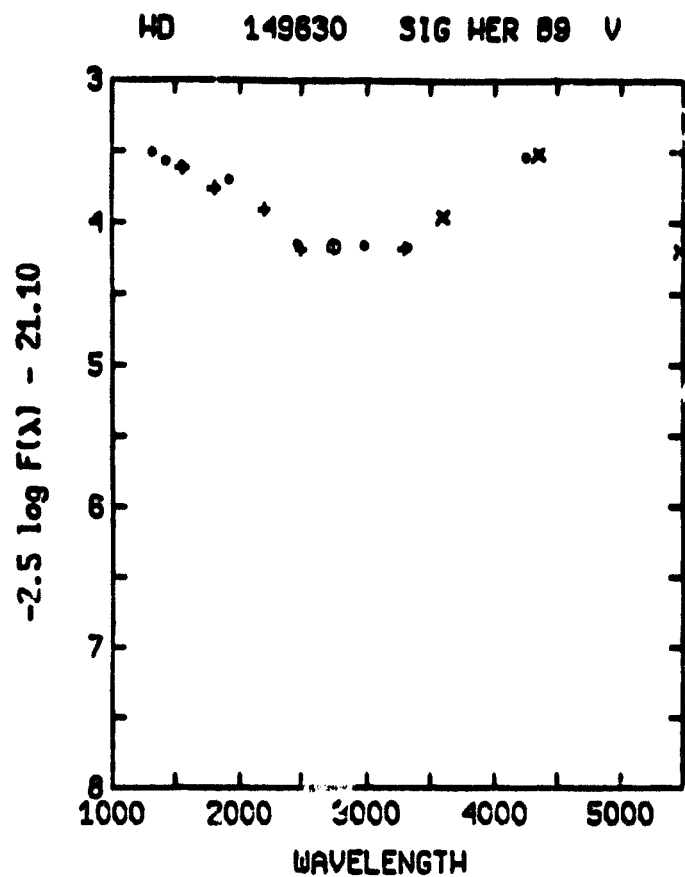


HD 15130 RHO CET B9 V

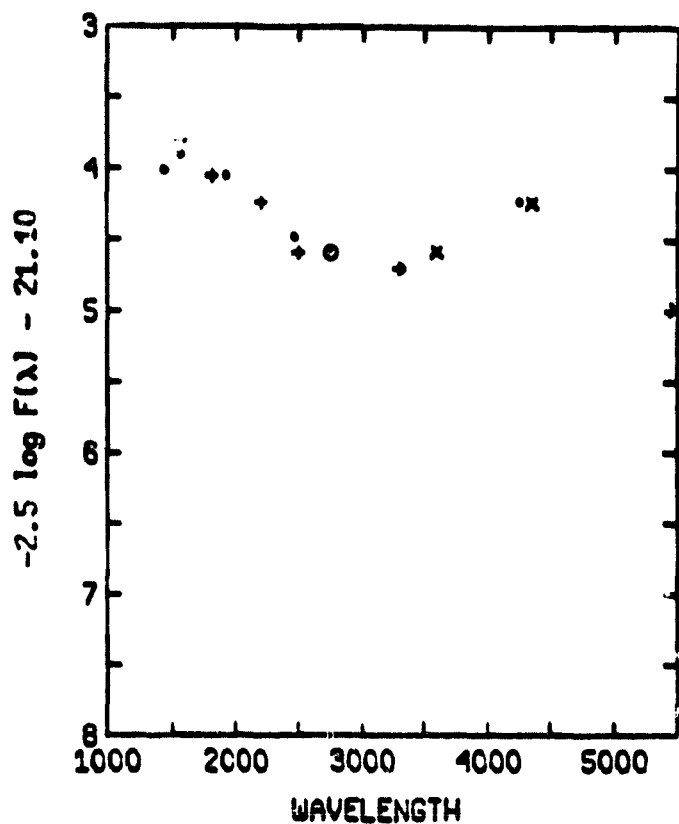


HD 218045 ALF PEG B9 V

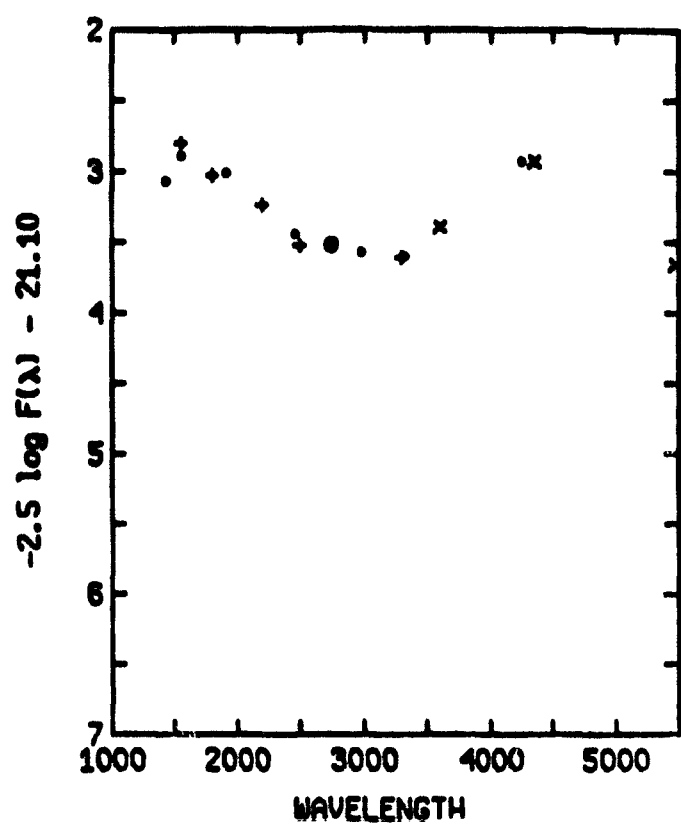




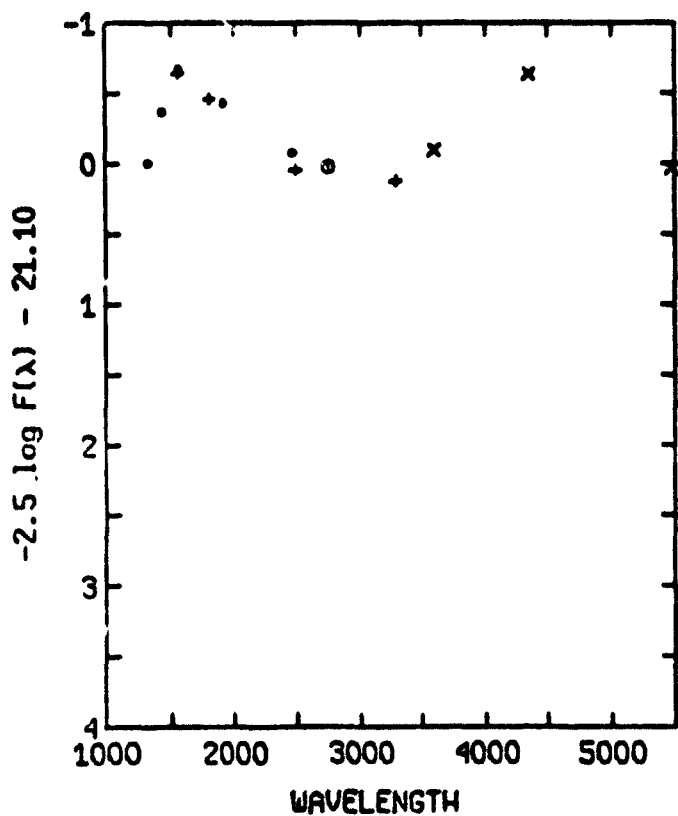
HD 143807 10T CRB A011-111



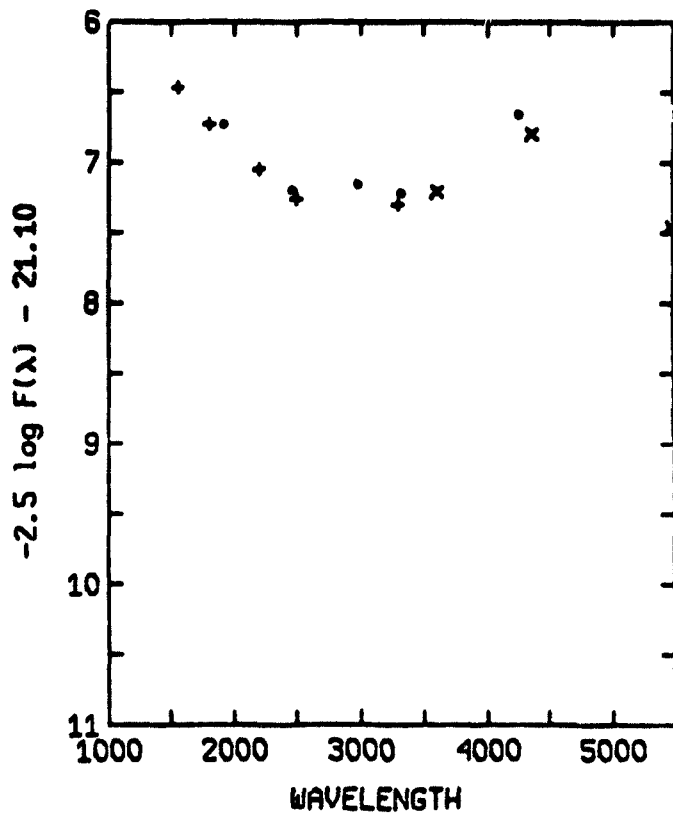
HD 123299 ALF DRA A0 111



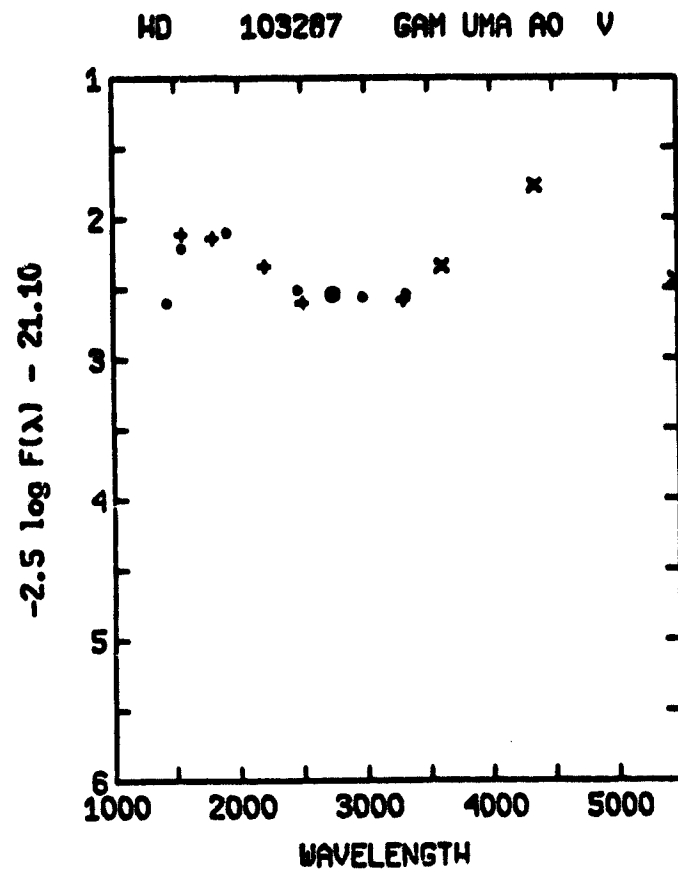
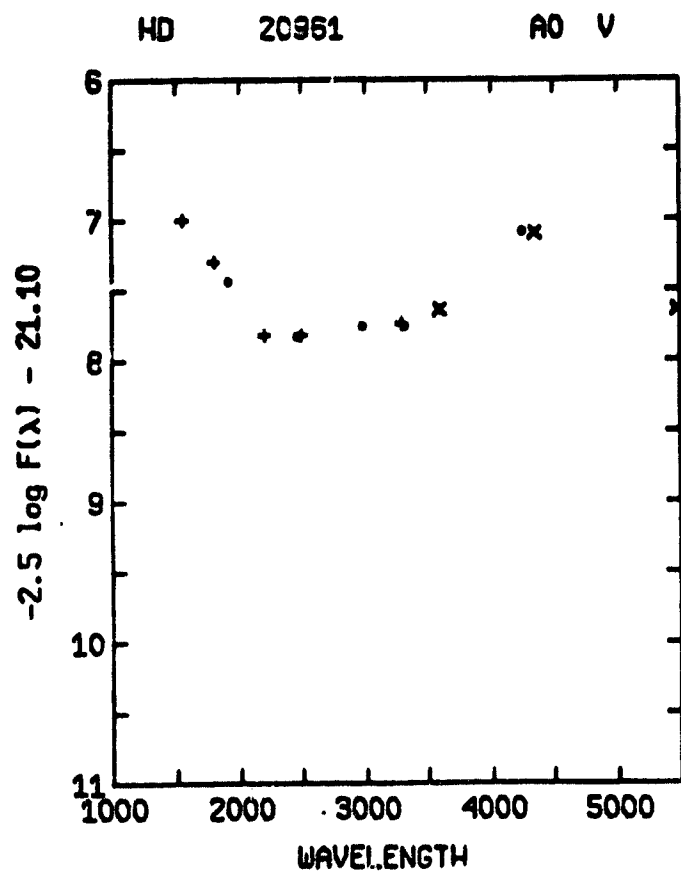
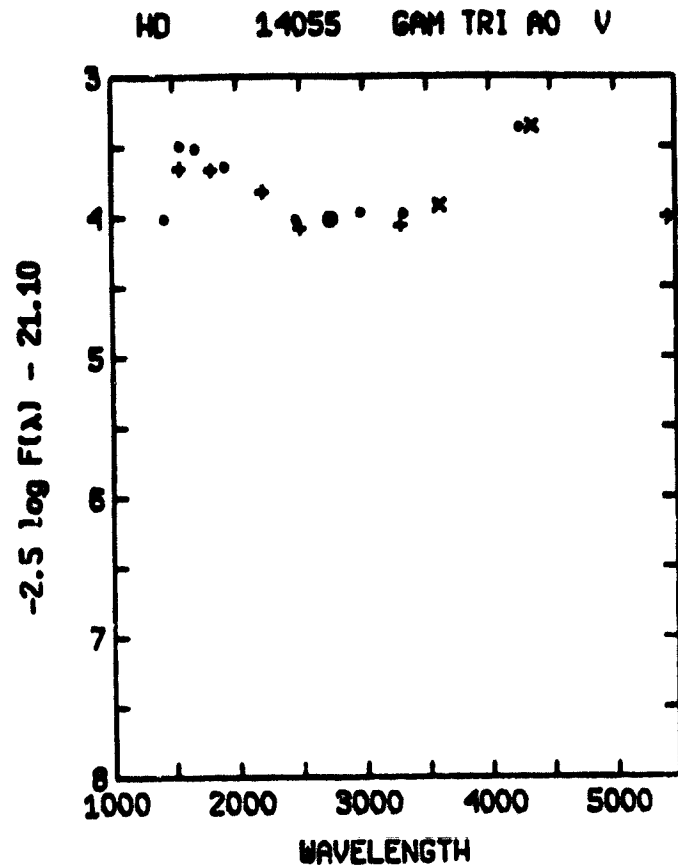
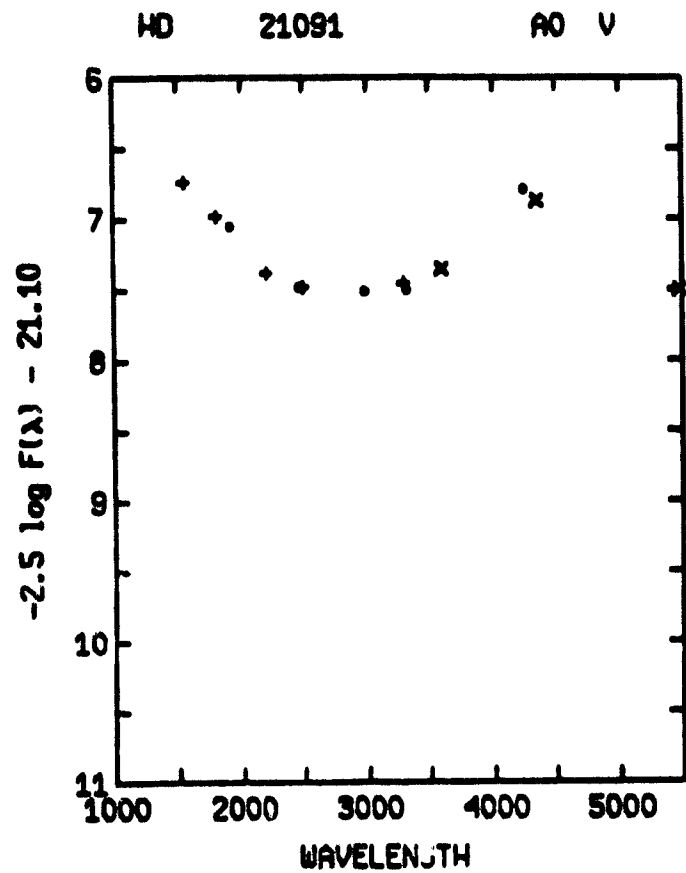
HD 172167 ALF LYR A0 V



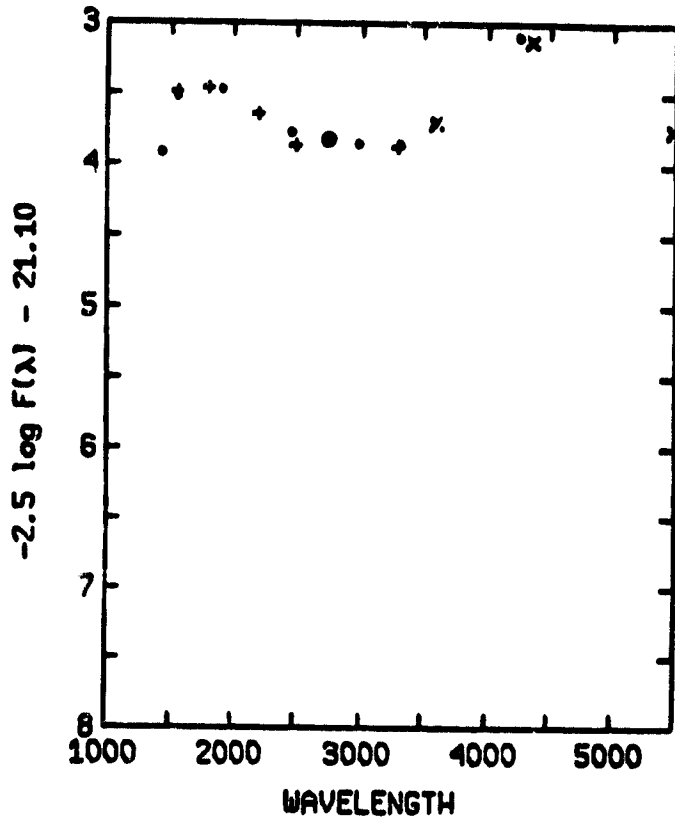
HD 22401 A0 V



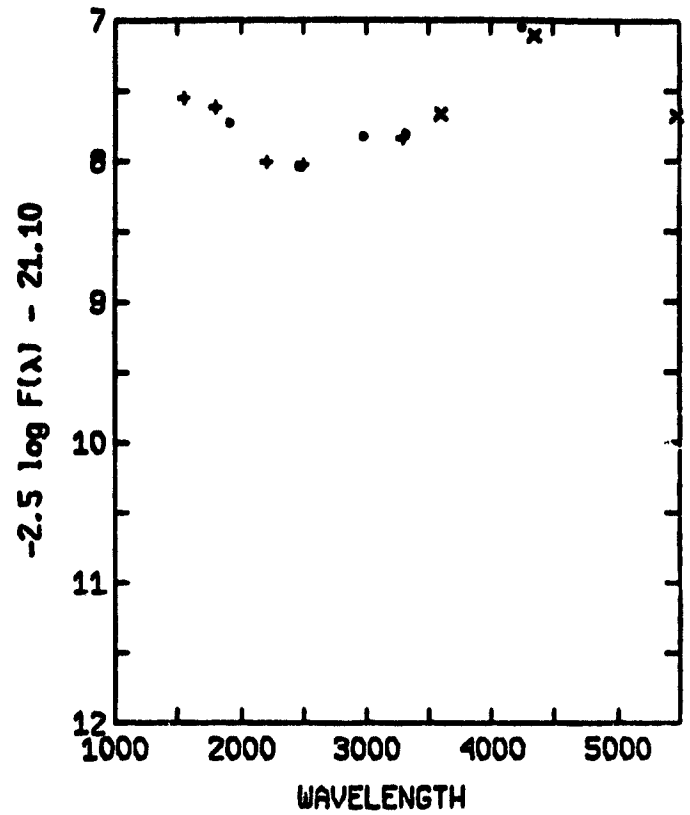
AO stars
Y5-Y8



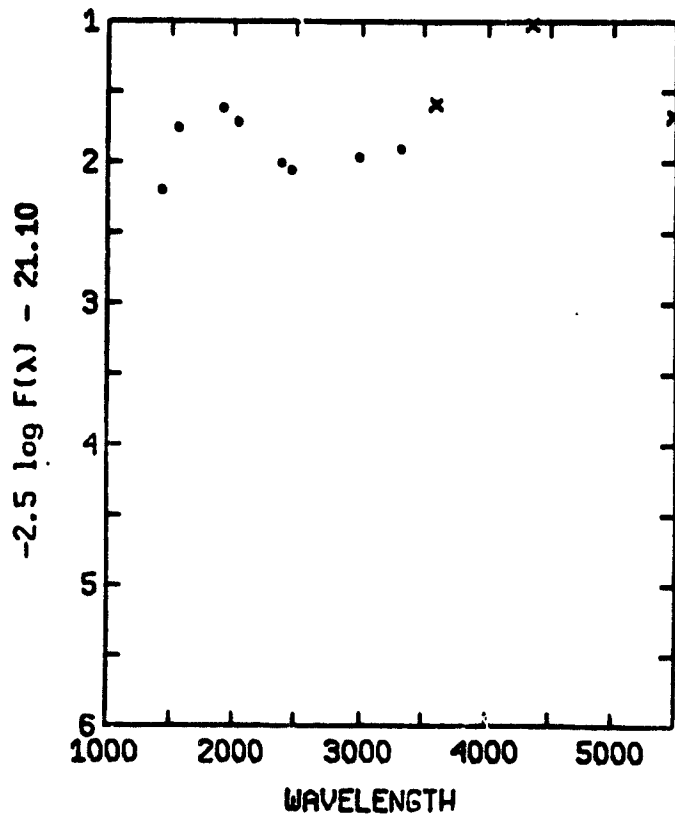
HD 161868 GAM OPH A0 V



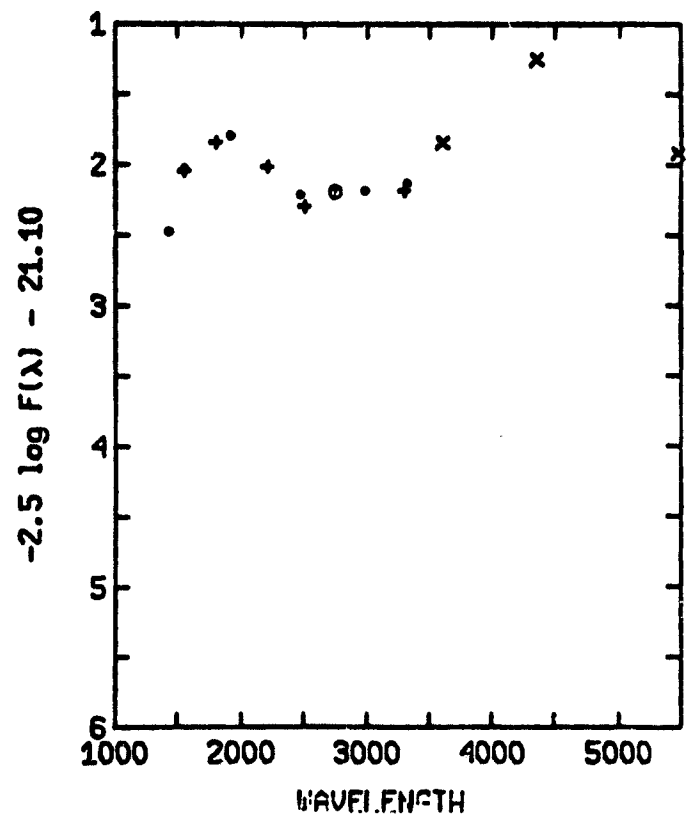
HD 21481 A0 V

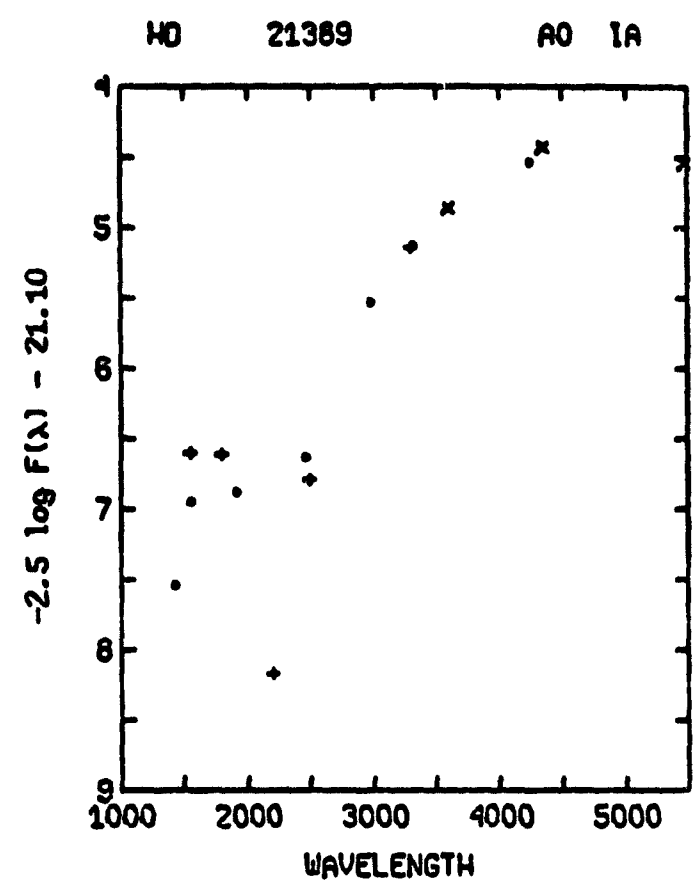
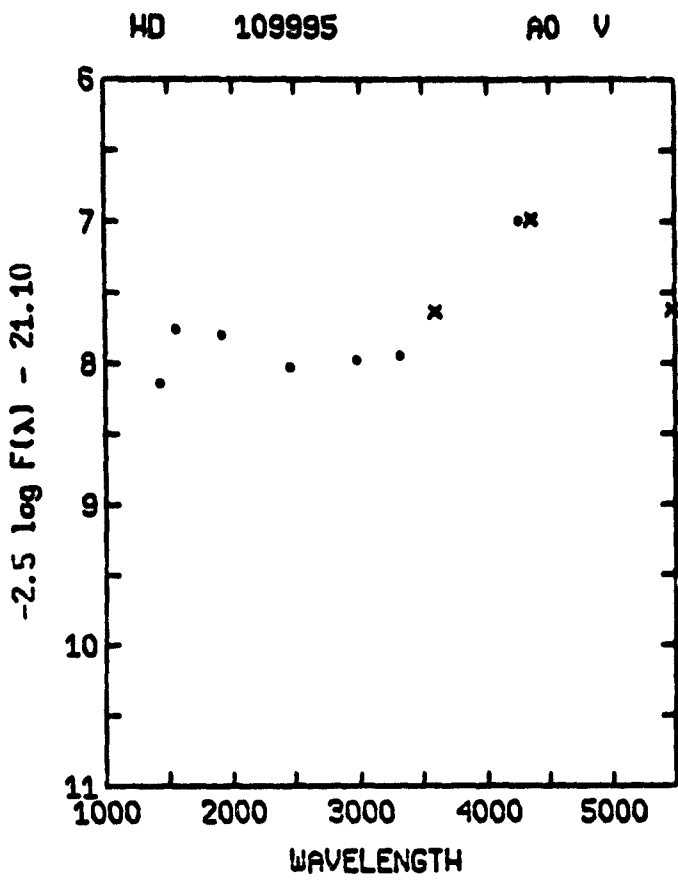


HD 60007 BET CAR A0 III

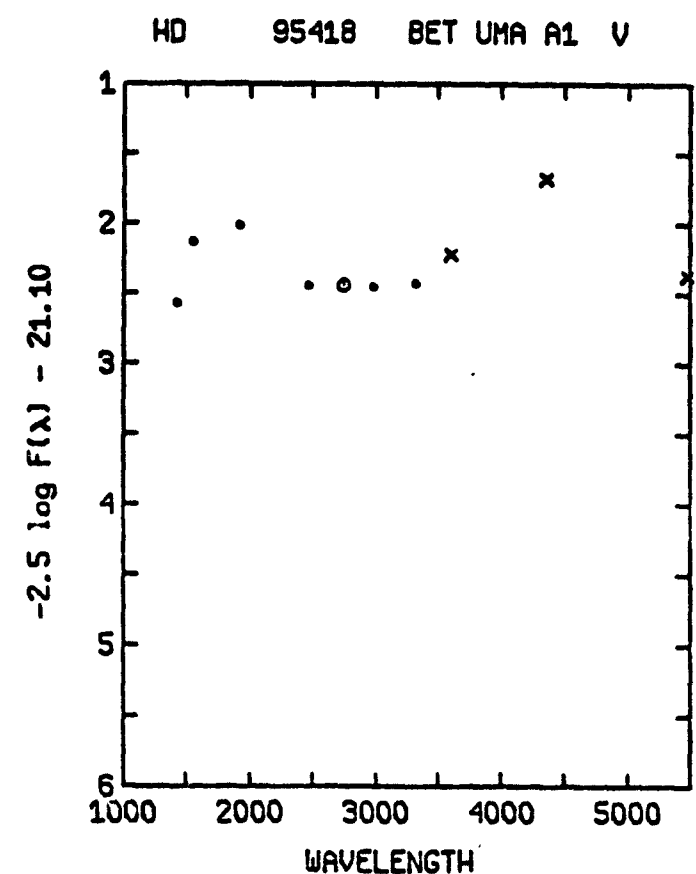
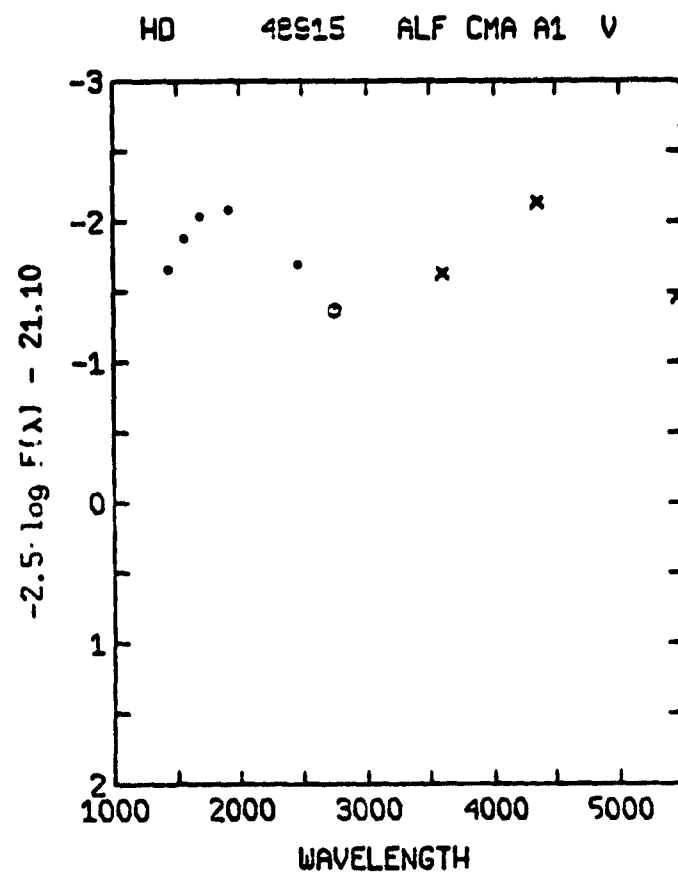


HD 47105 GAM GEM A0 IV

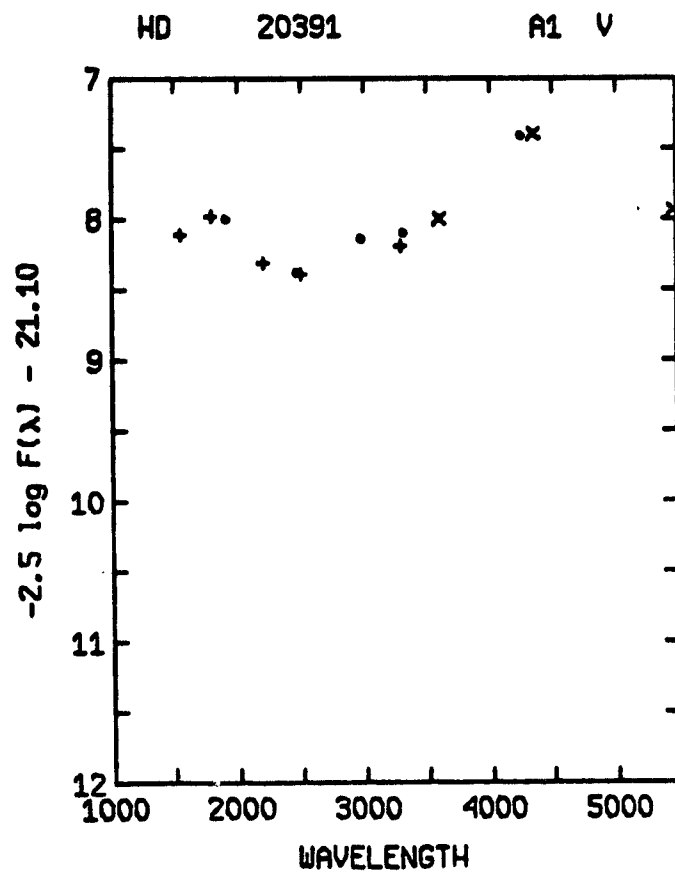
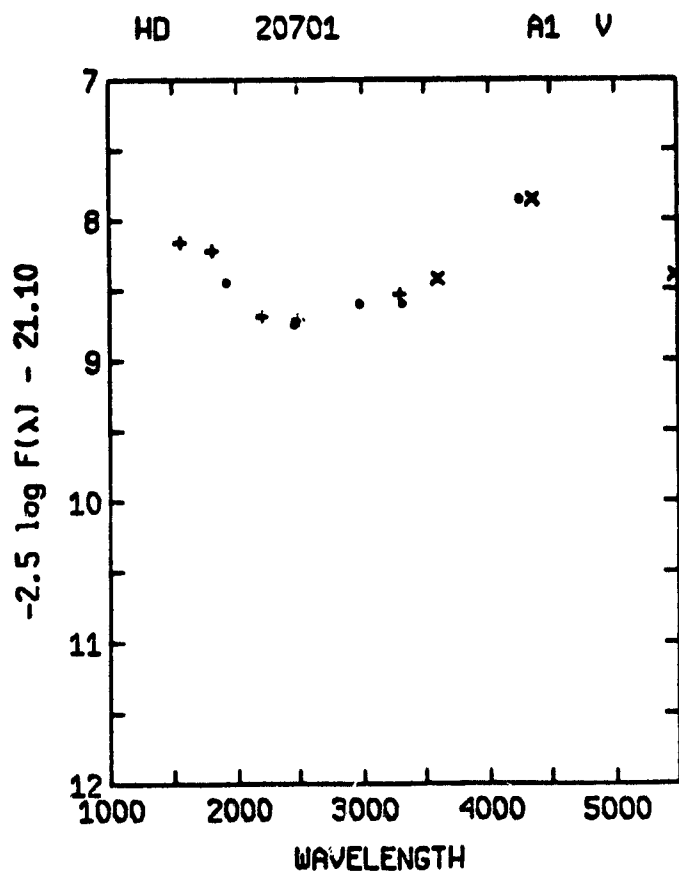
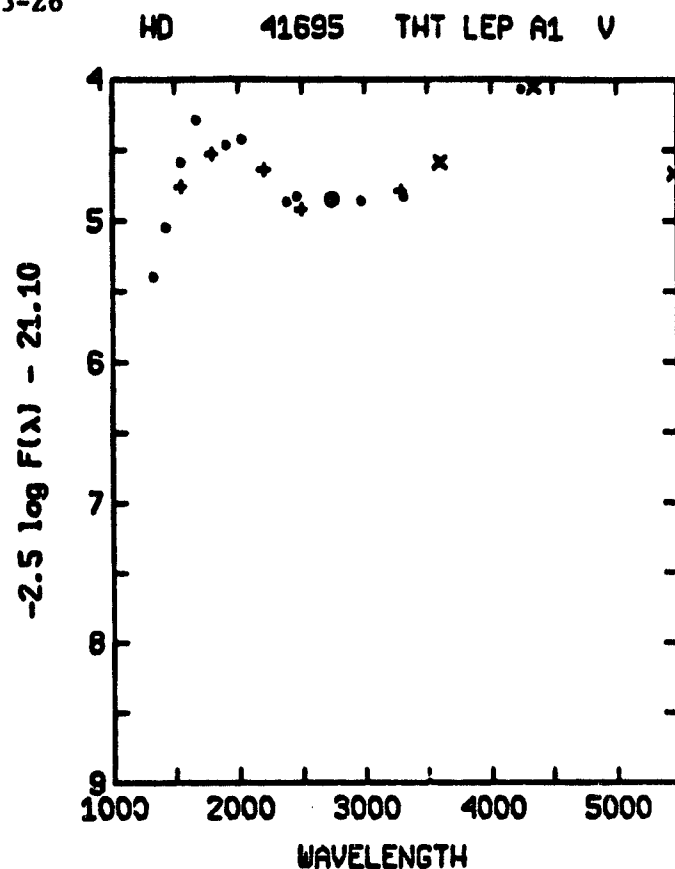
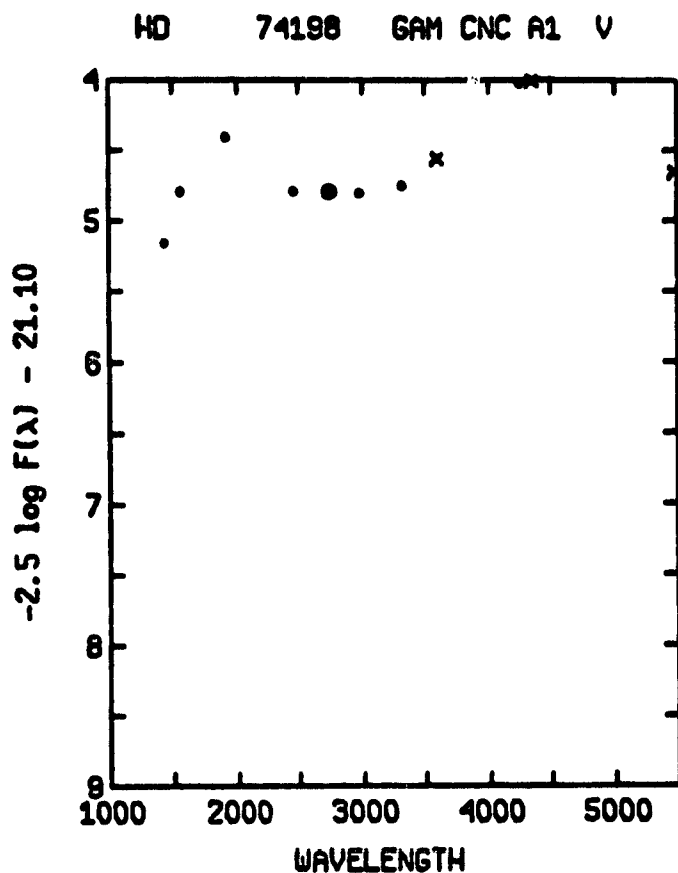




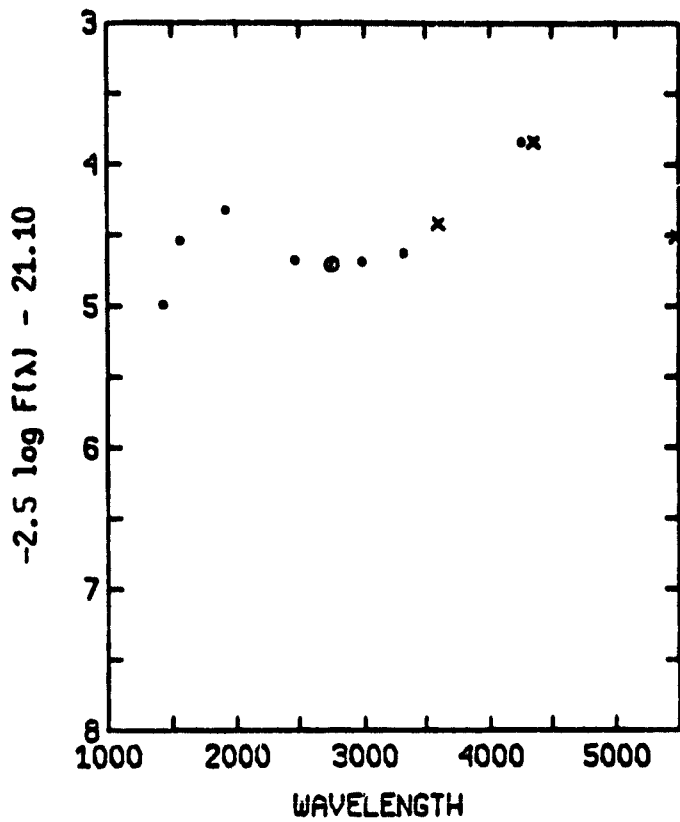
A1 stars
Z1-Z2



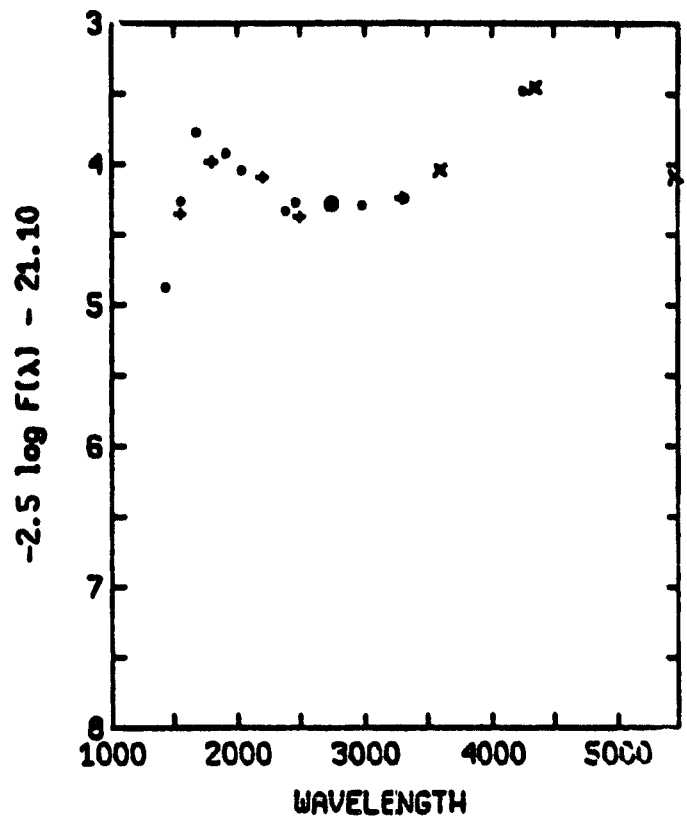
A1 stars
23-26



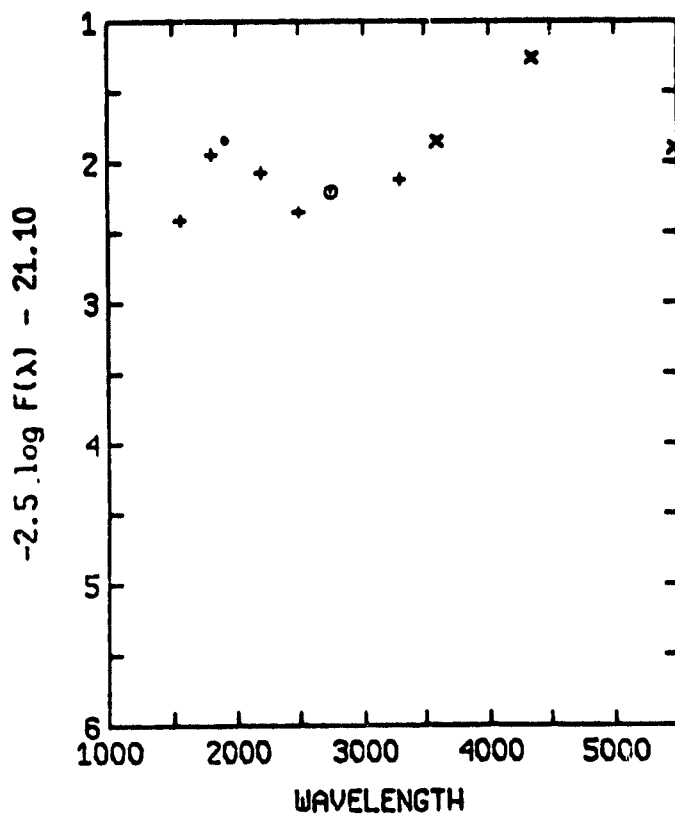
HD 82621 26 UMA A2 V



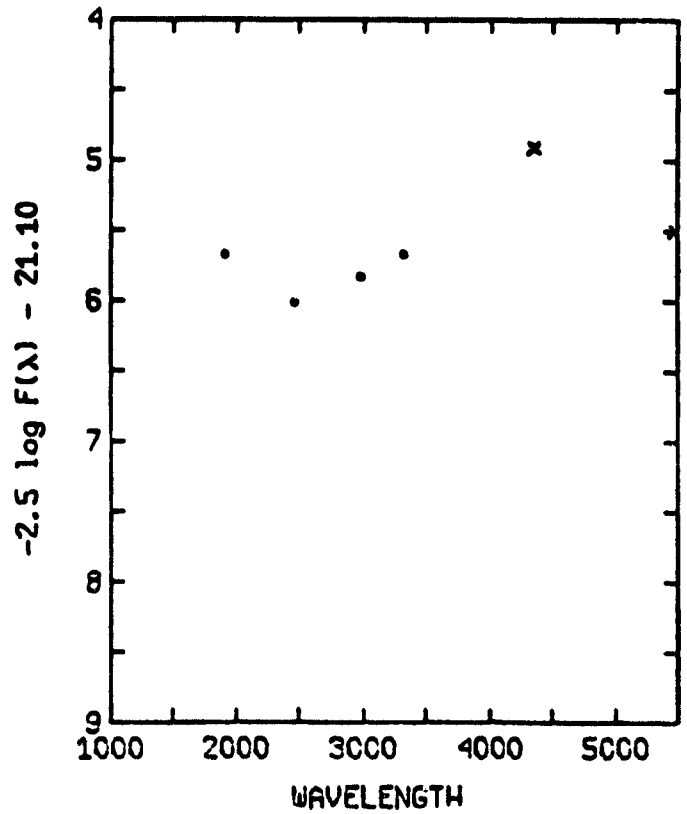
HD 15008 DEL HYI A2 V

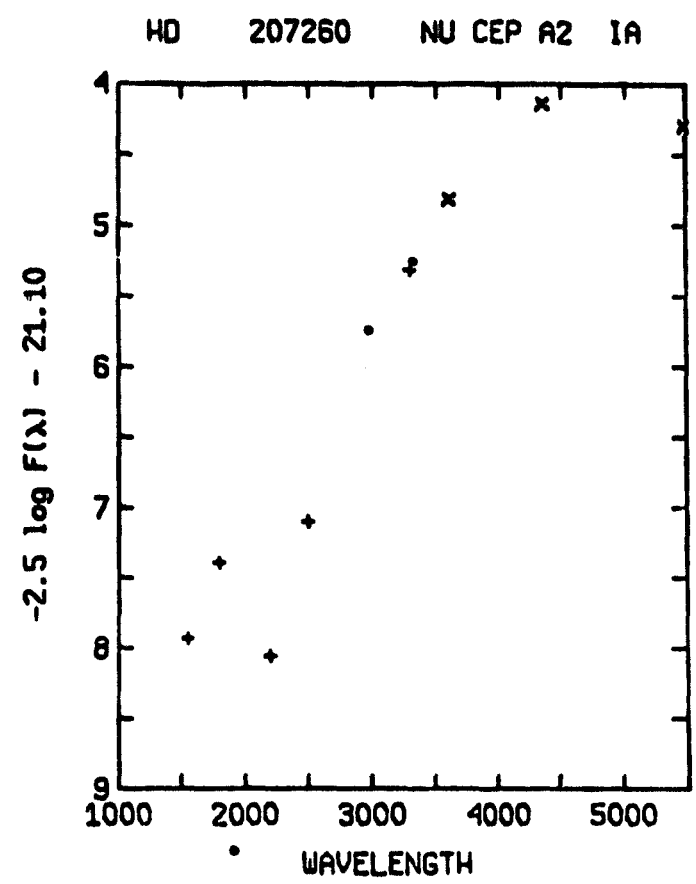
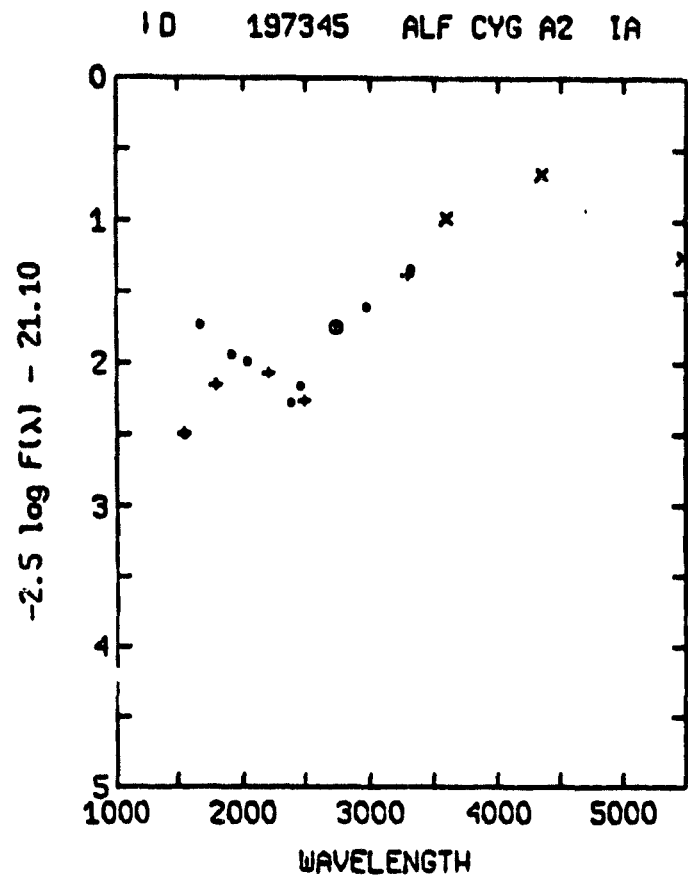


HD 40183 BET AUR A2 V

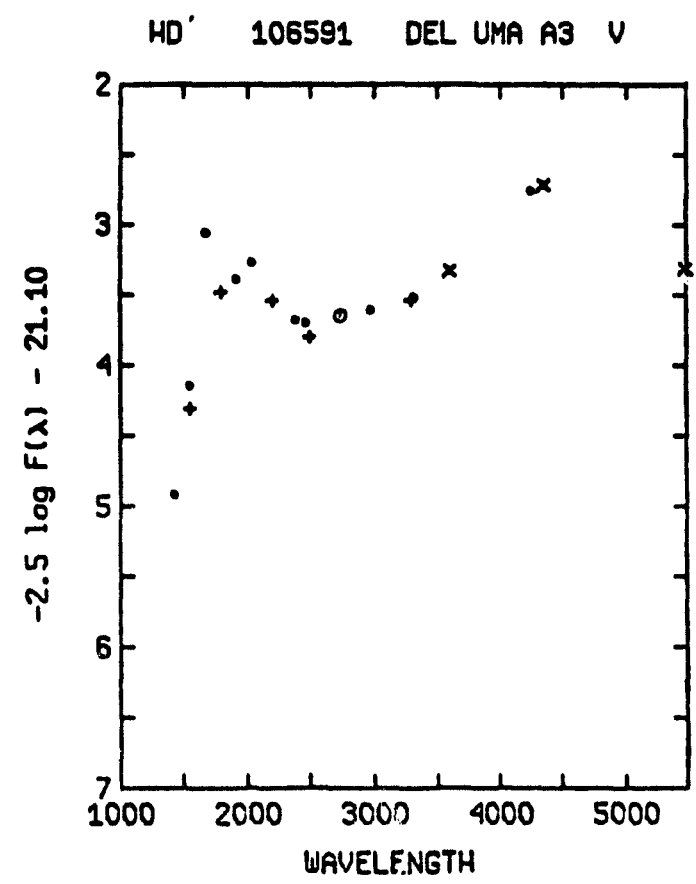
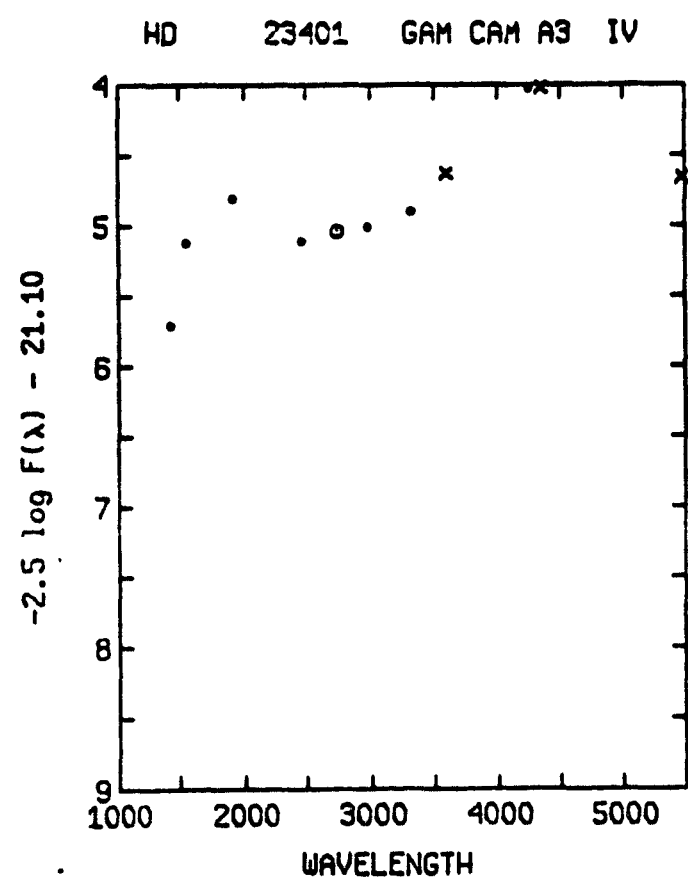


HD 6178 SIG SCL A2 V

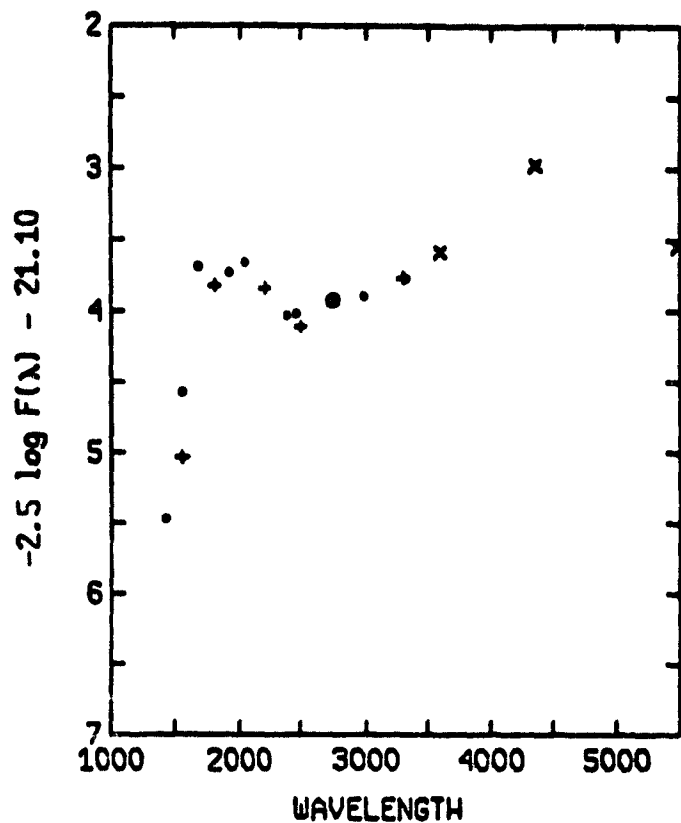




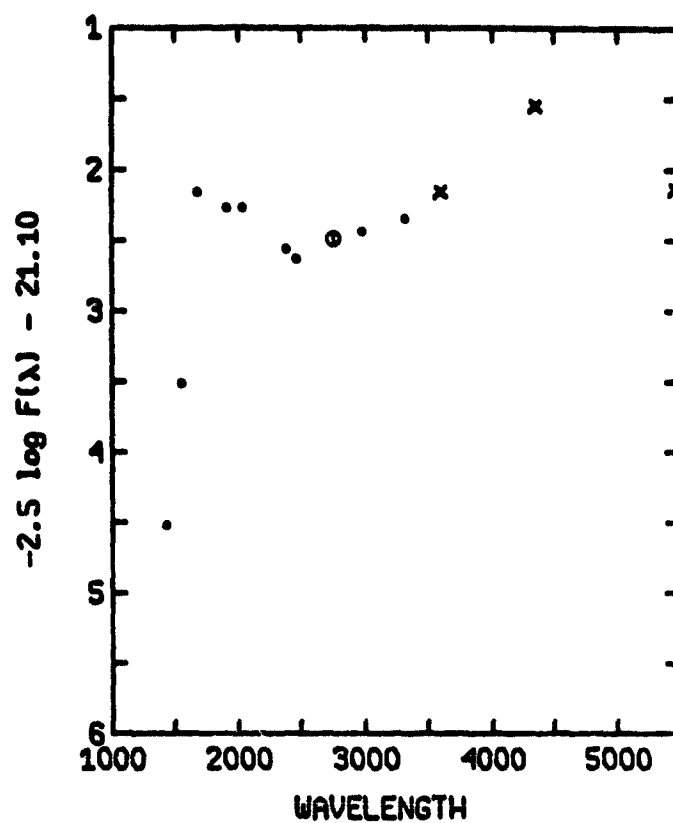
A3 stars
BB1-BB2



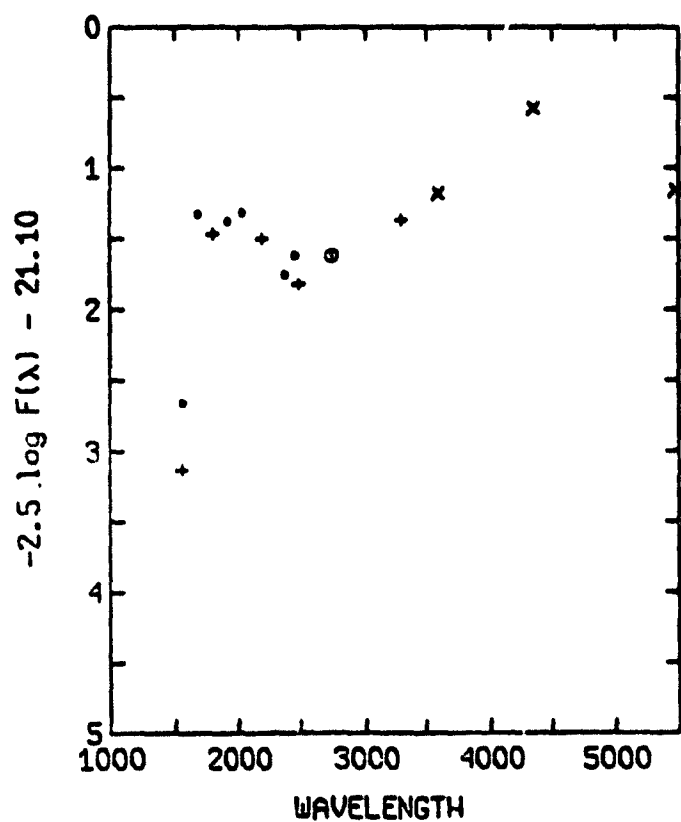
HD 38678 ZET LEP A3 V



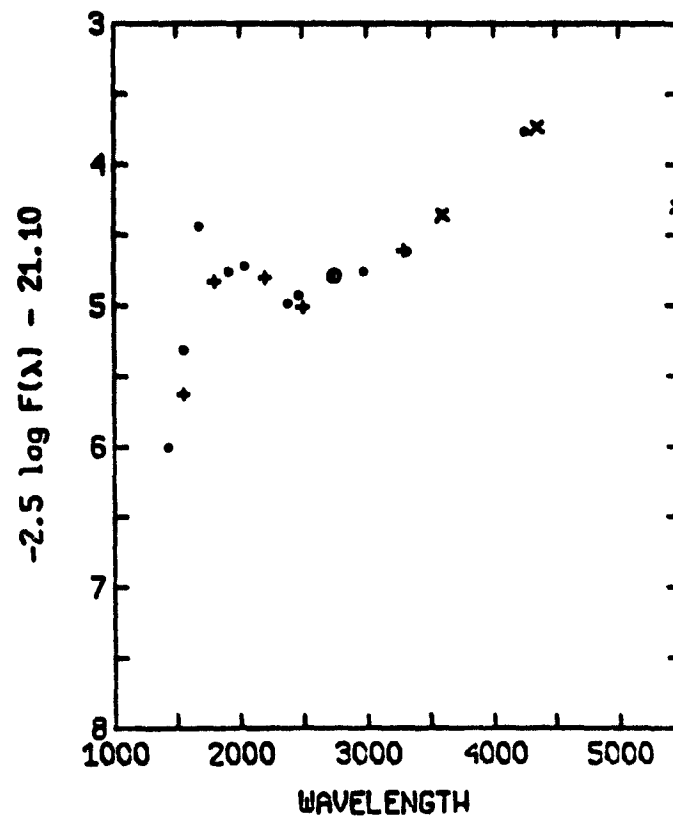
HD 102647 BET LEO A3 V



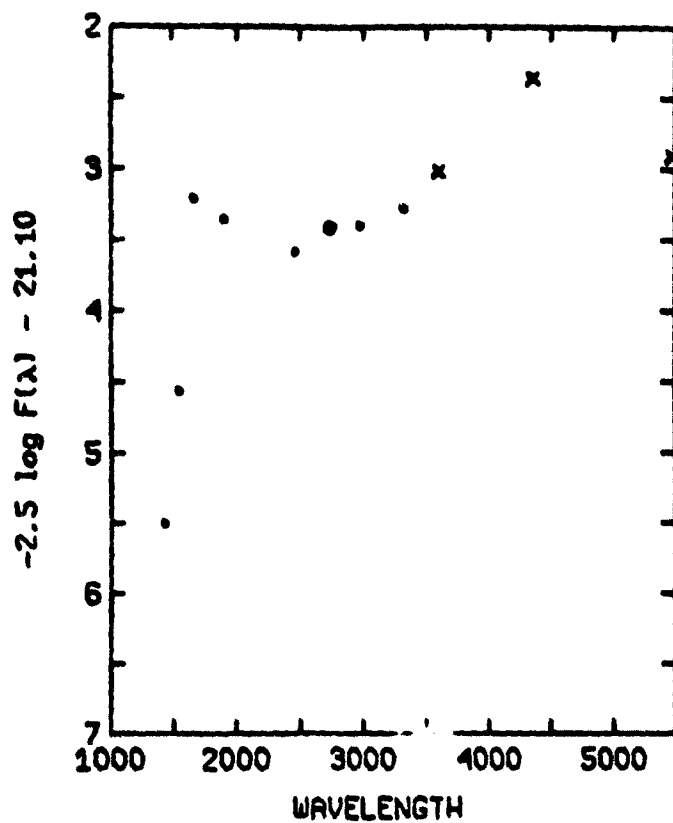
HD 216956 ALF PSA A3 V



HD 192696 33 CYG A3 IV-V

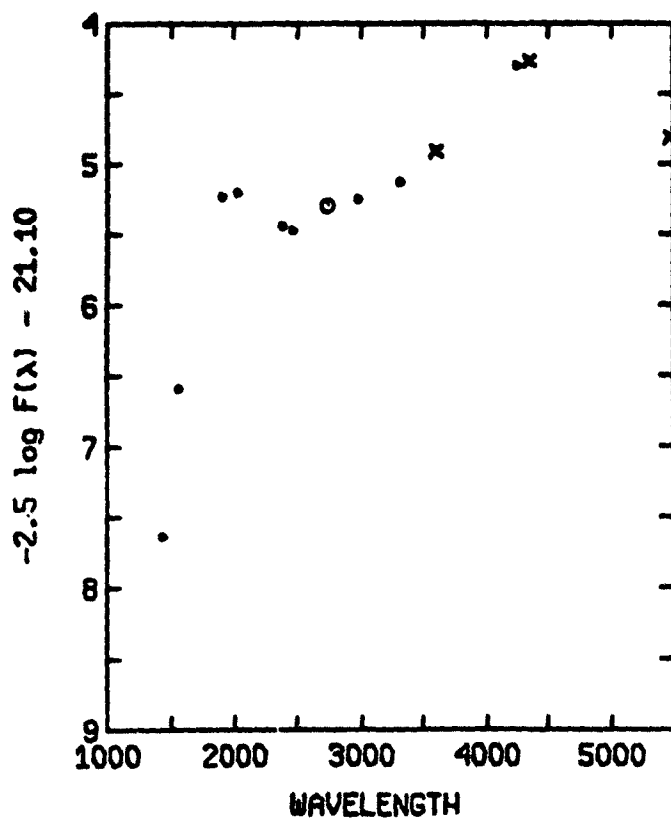


HD 10622/3 THT ER1 A3 V

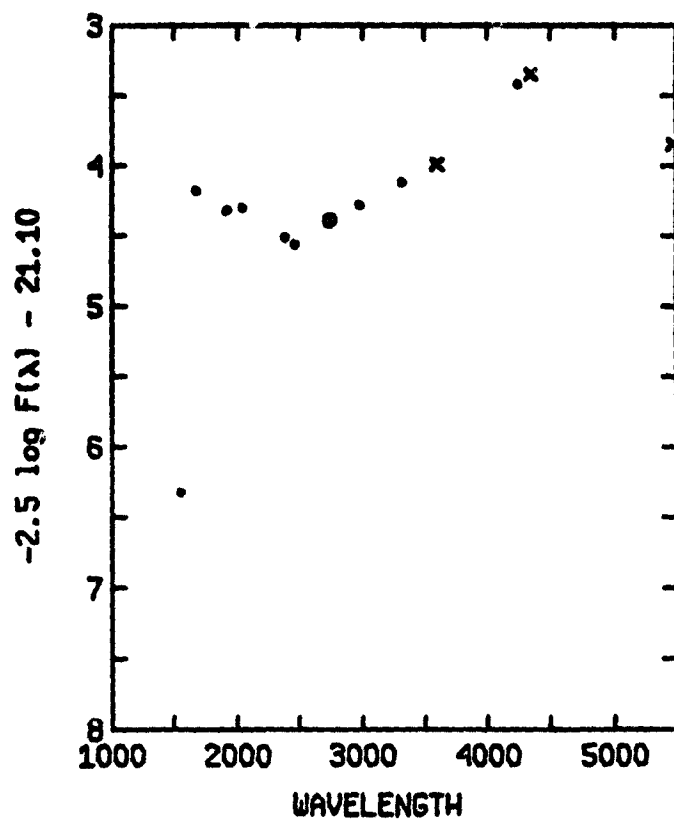


A4-5 stars
CC1-CC2

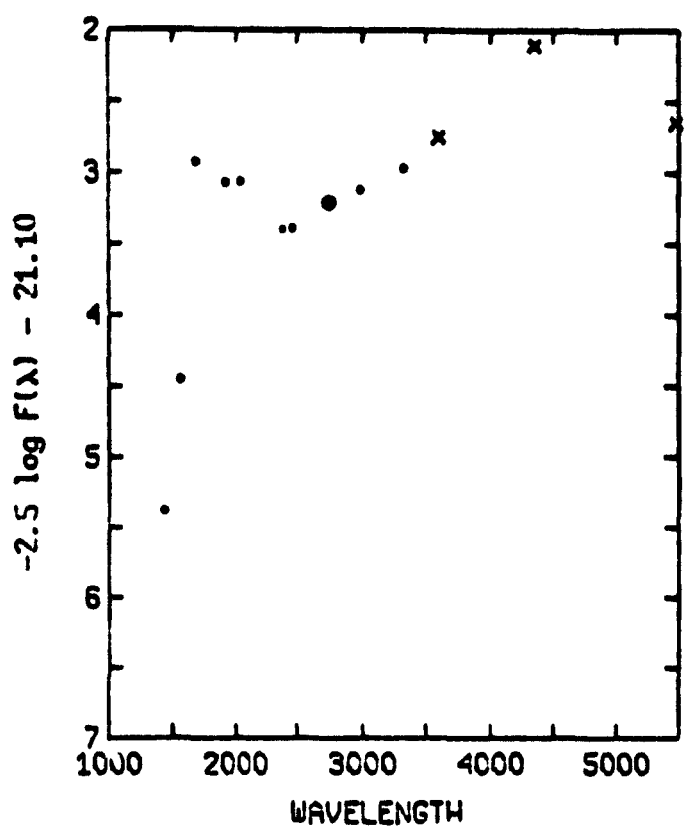
HD 37507 49 ORI A4 IV



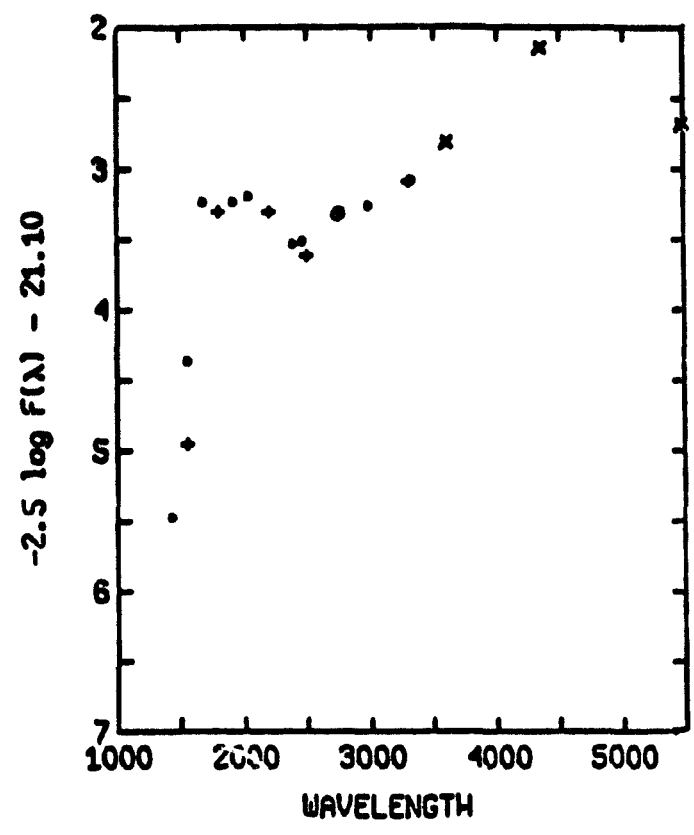
HD 39060 BET PIC A5 III



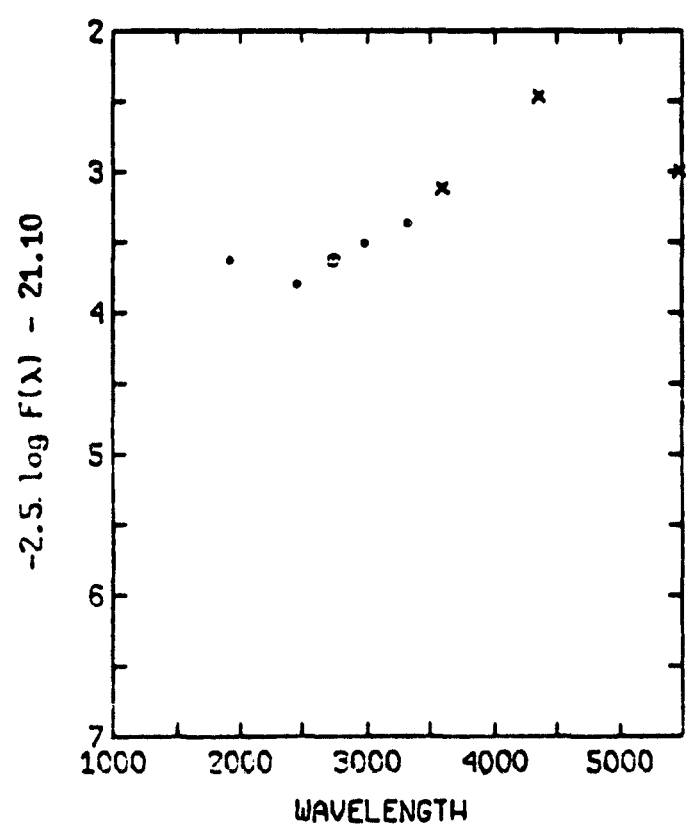
HD 11636 BET ARI A5 V



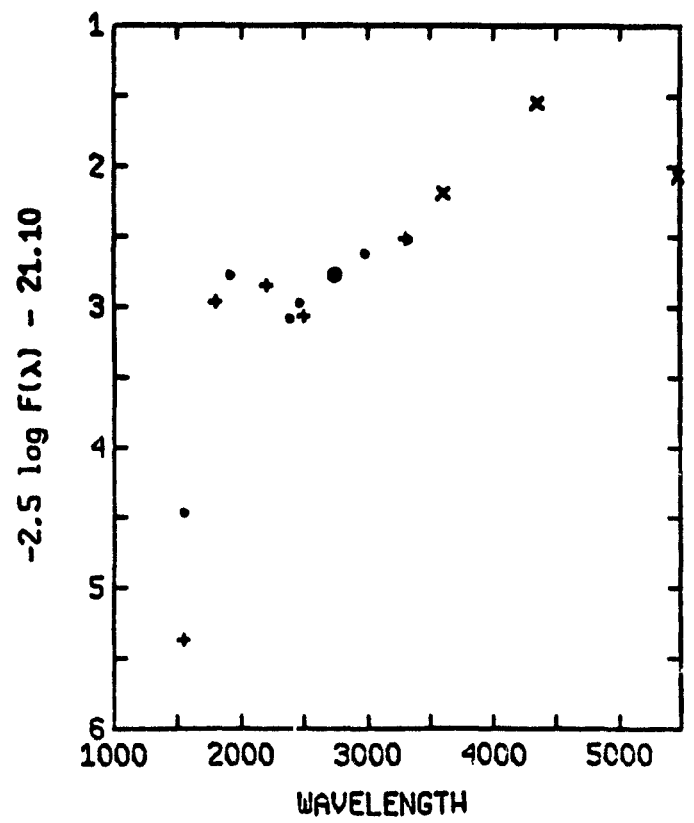
HD 8538 DEL CAS A5 V



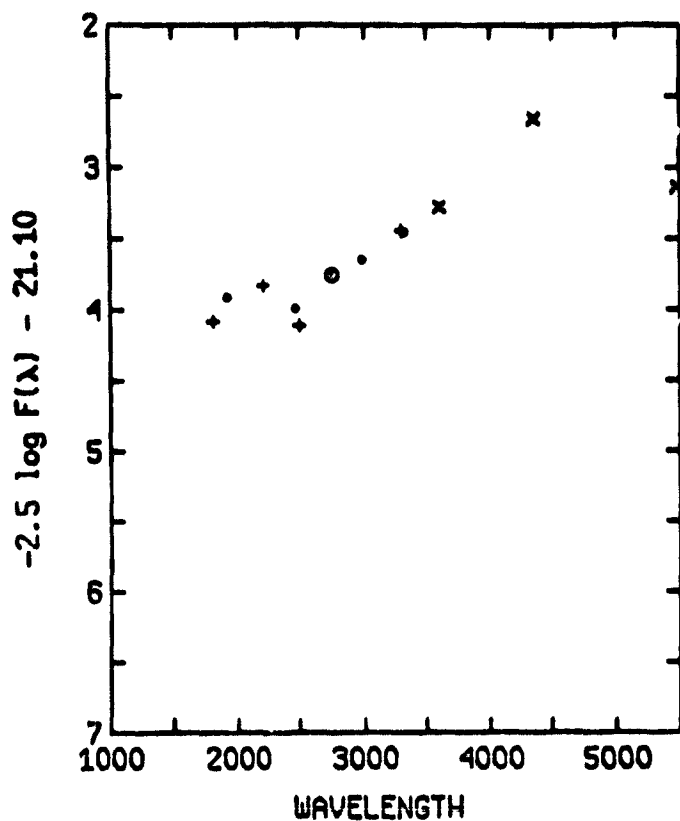
HD 13161 BET TRI A5 III



HD 159561 ALF OPH A5 III

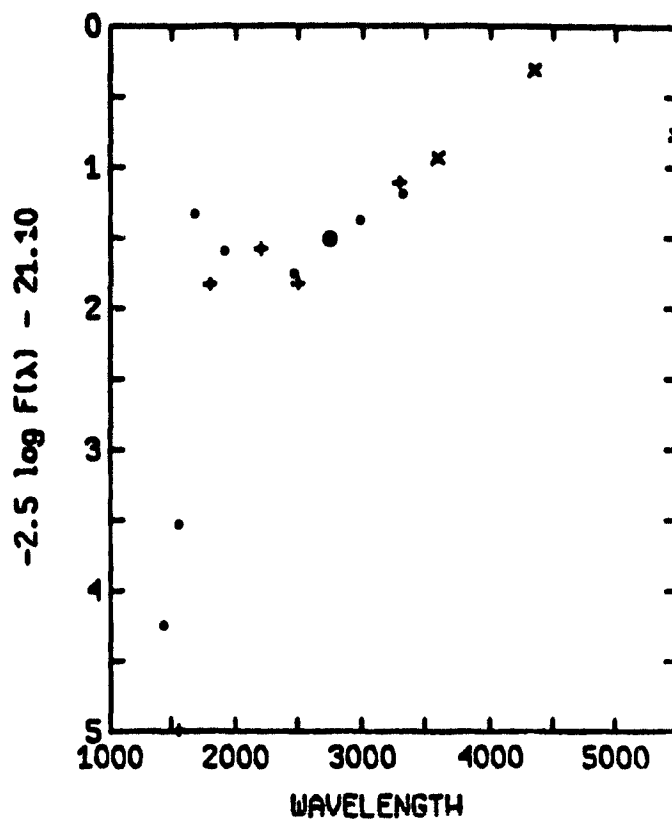


HD 76644 10T UMA A7 IV

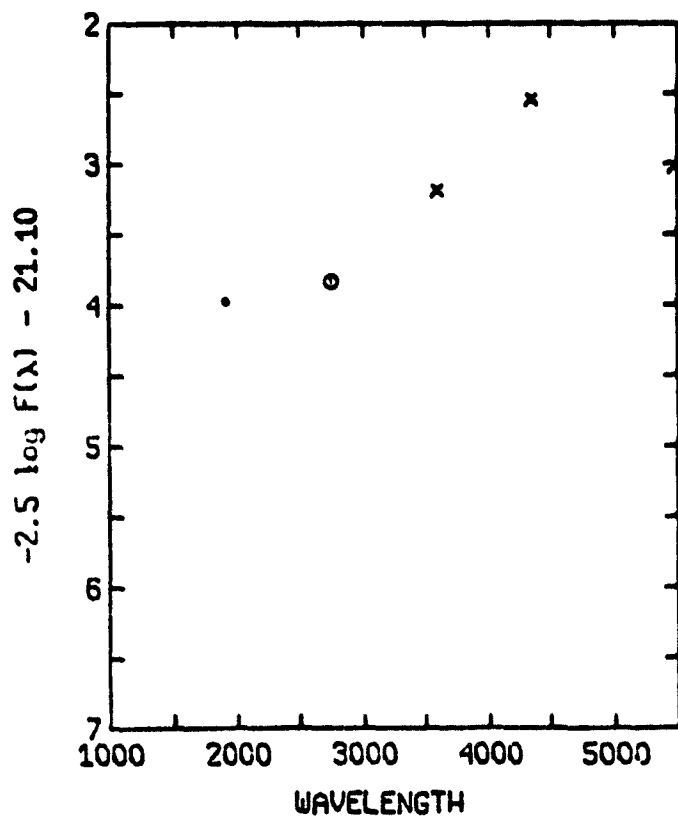


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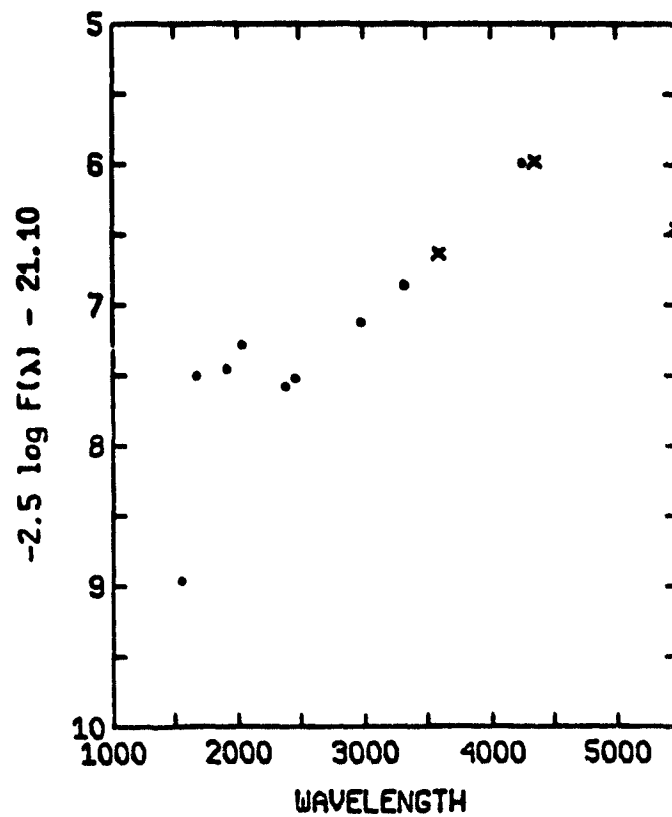
HD 187642 ALF AQL A7 IV-V

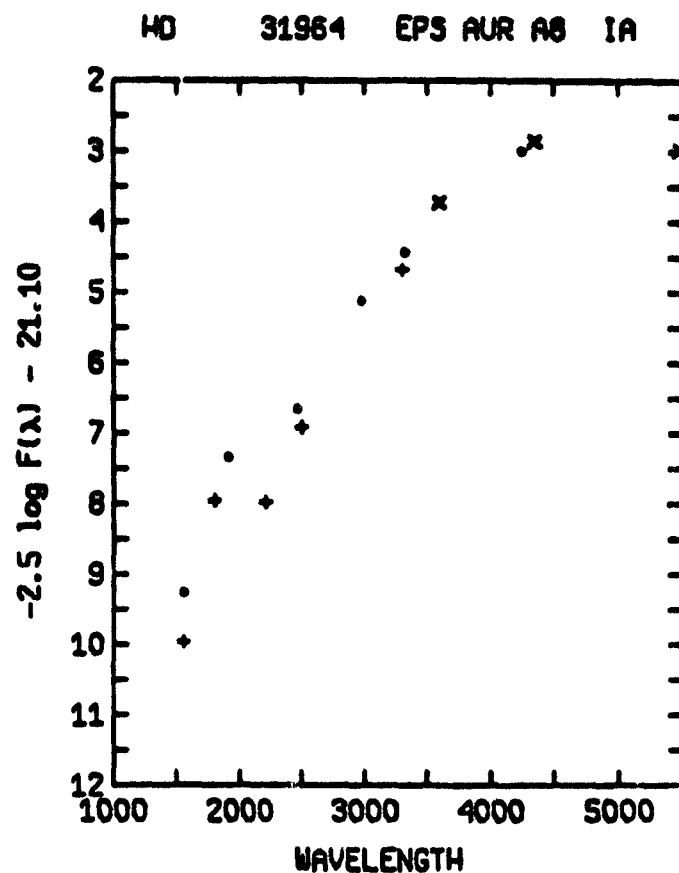
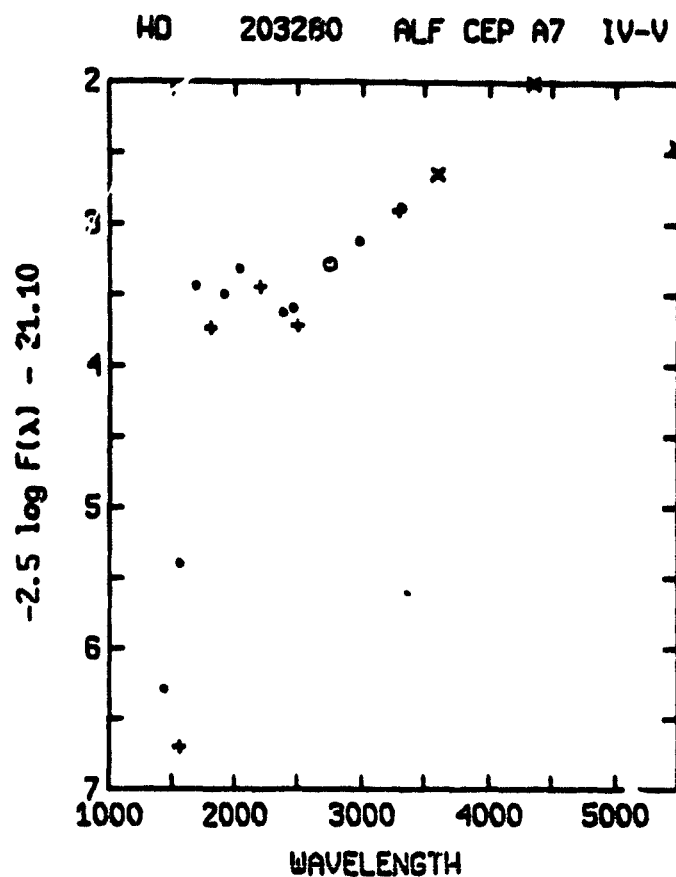


HD 127762 GAM 800 A7 III

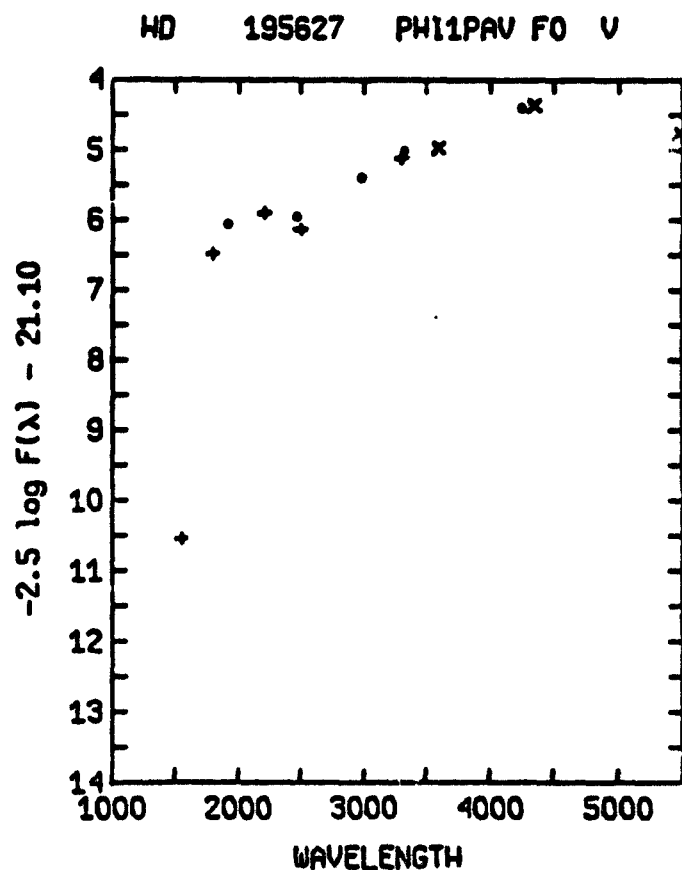
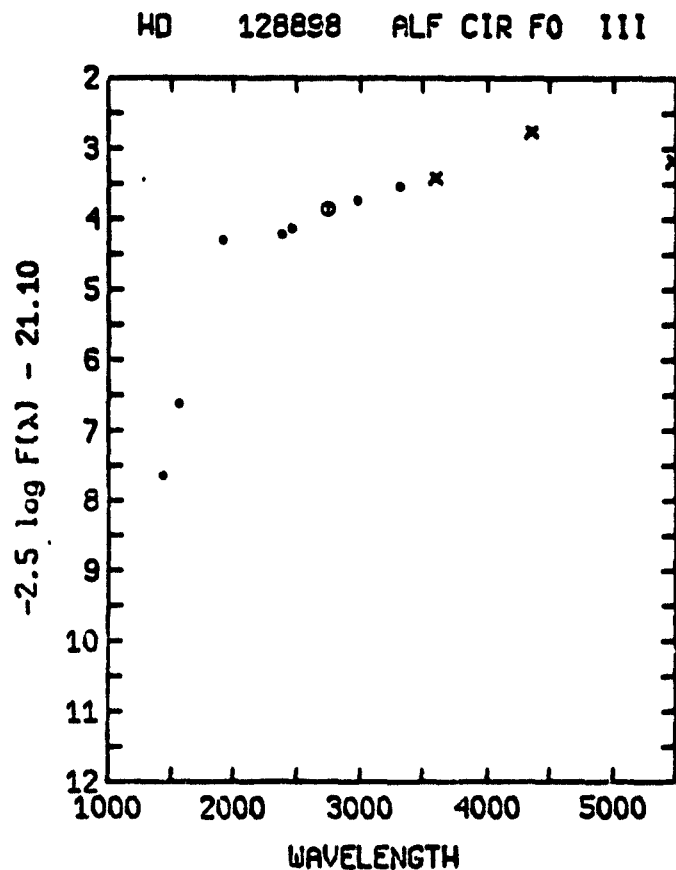


HD 68457 D A7

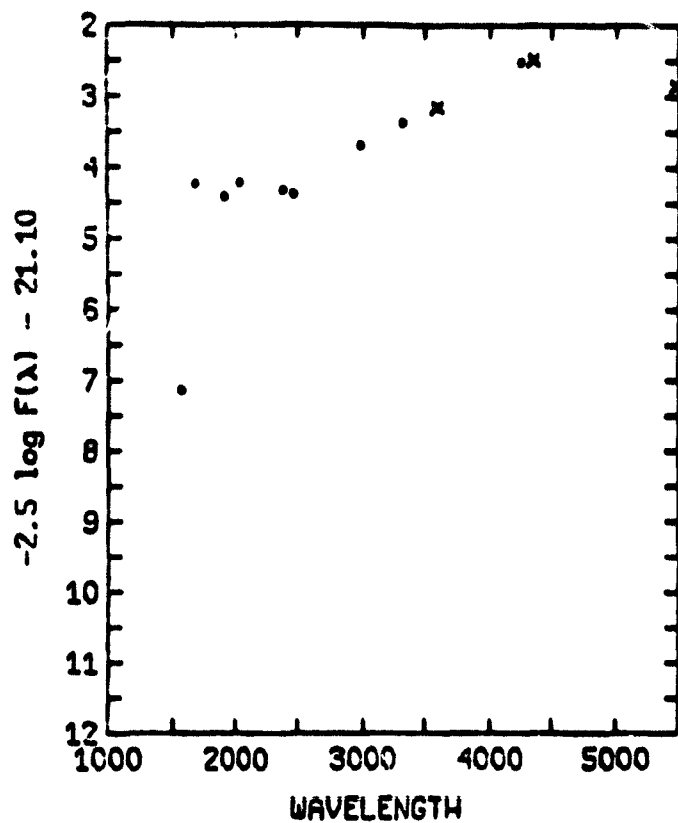




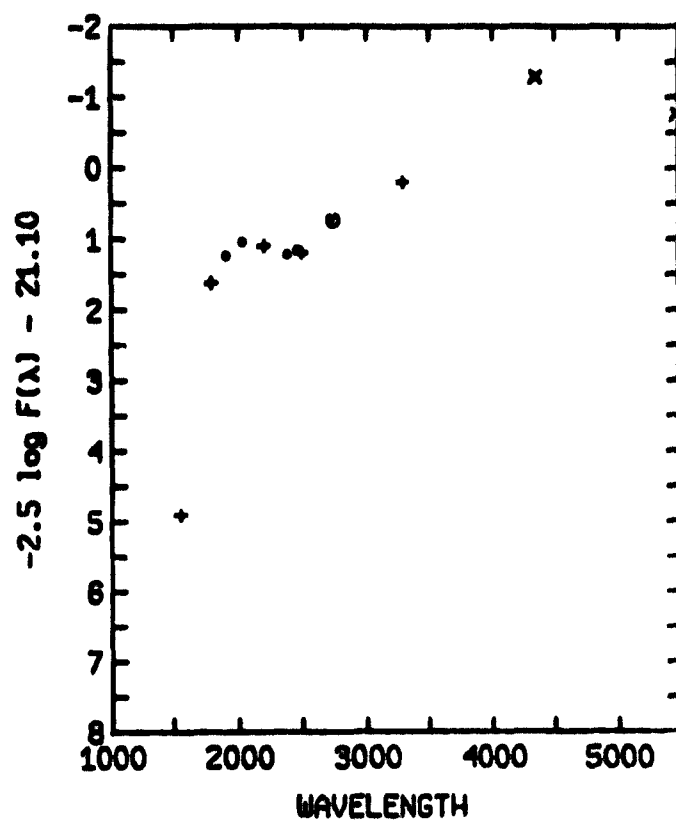
F0 stars
EE1-EE2



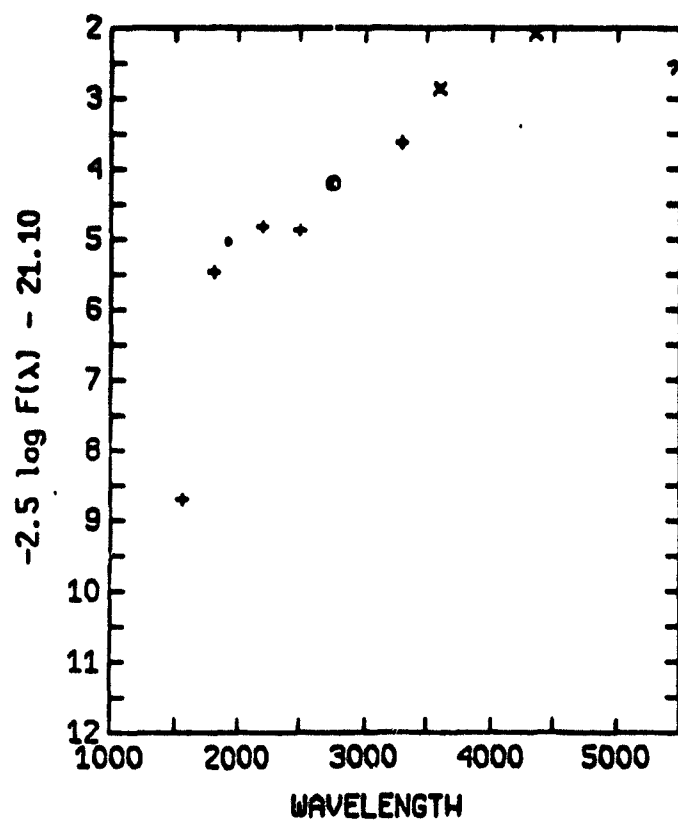
HD 12311 ALF HYI F0 V

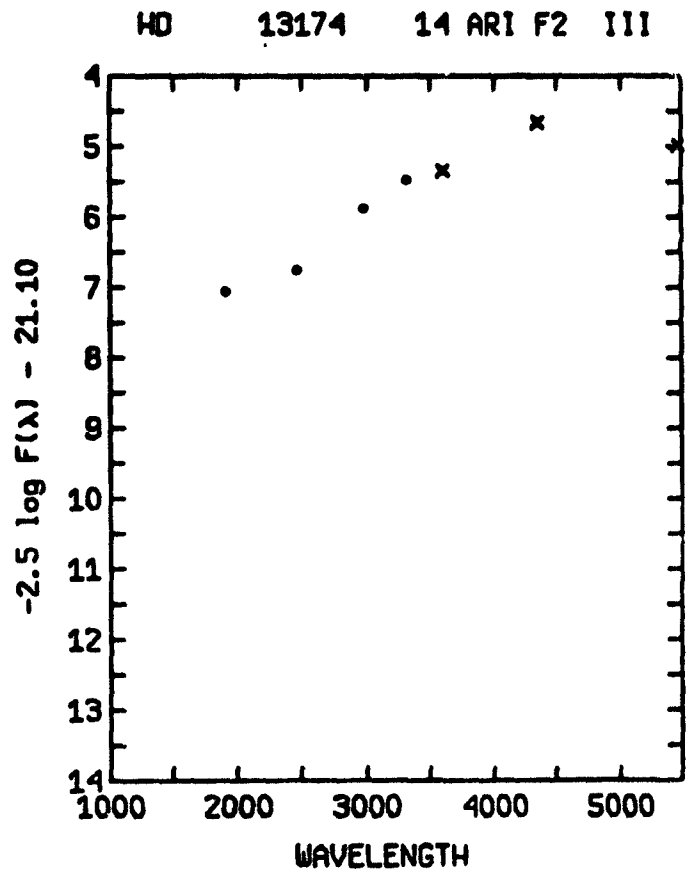
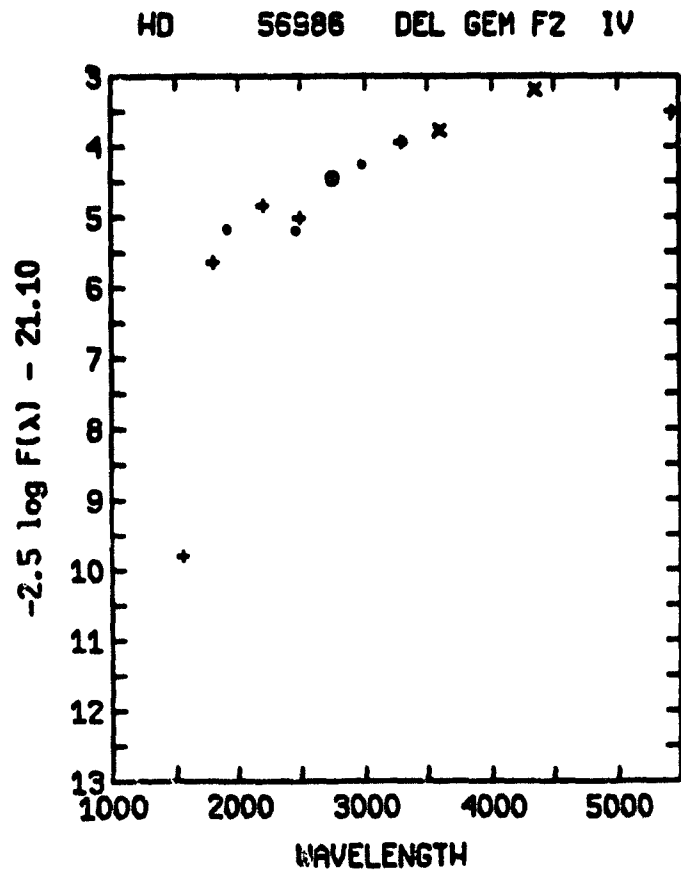
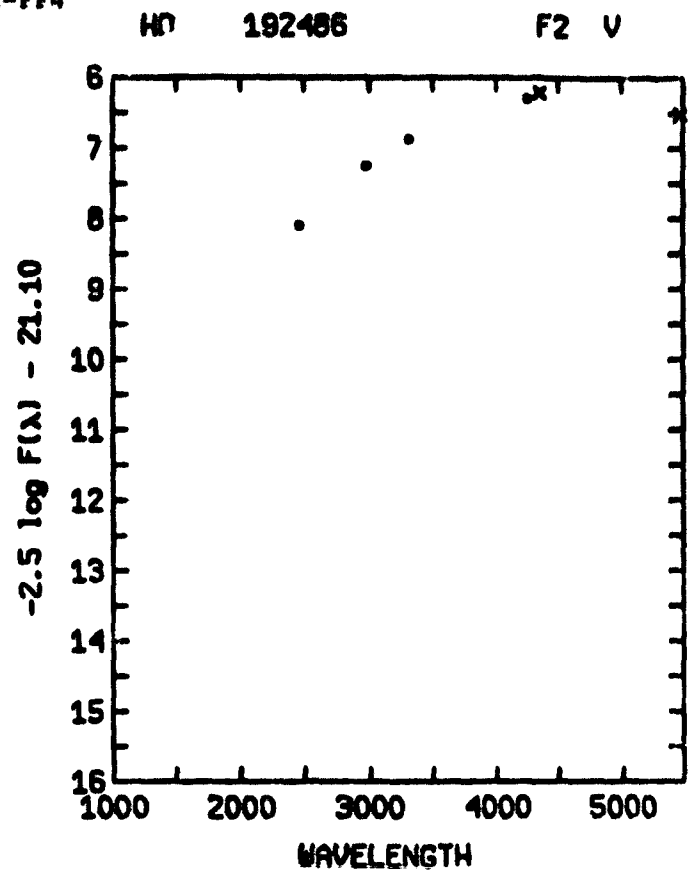
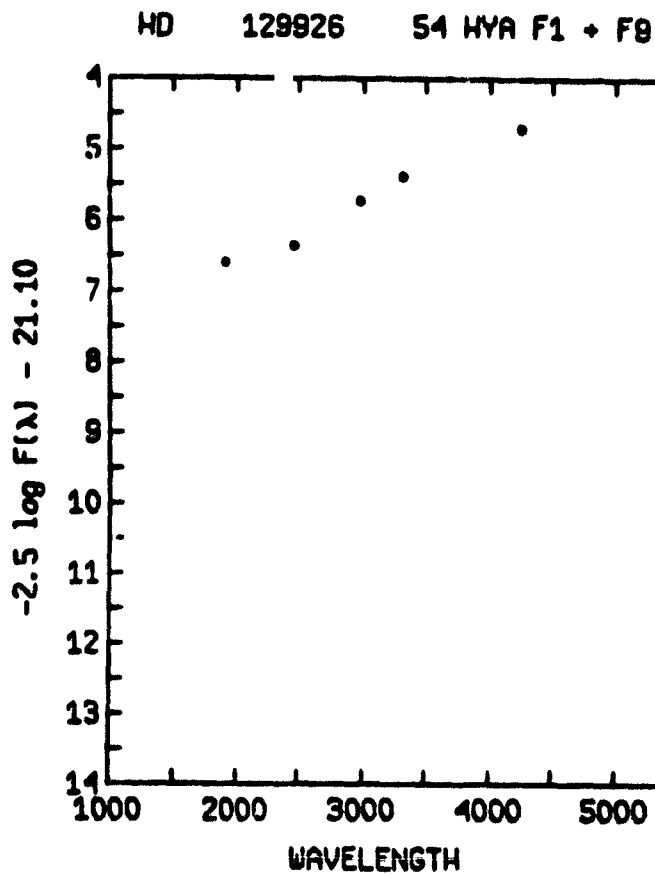


HD 45348 ALF CAR F0 IB

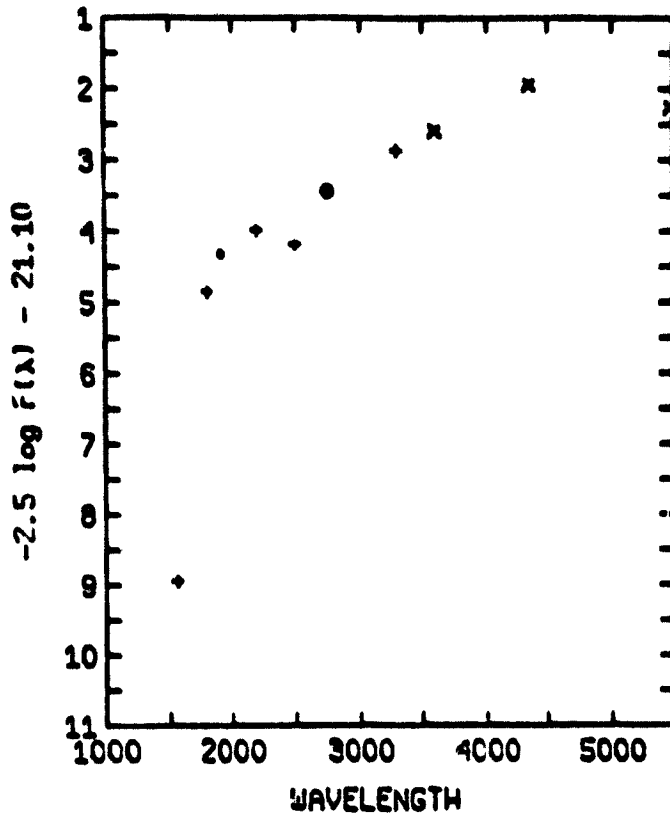


HD 36673 ALF LEP F0 IB

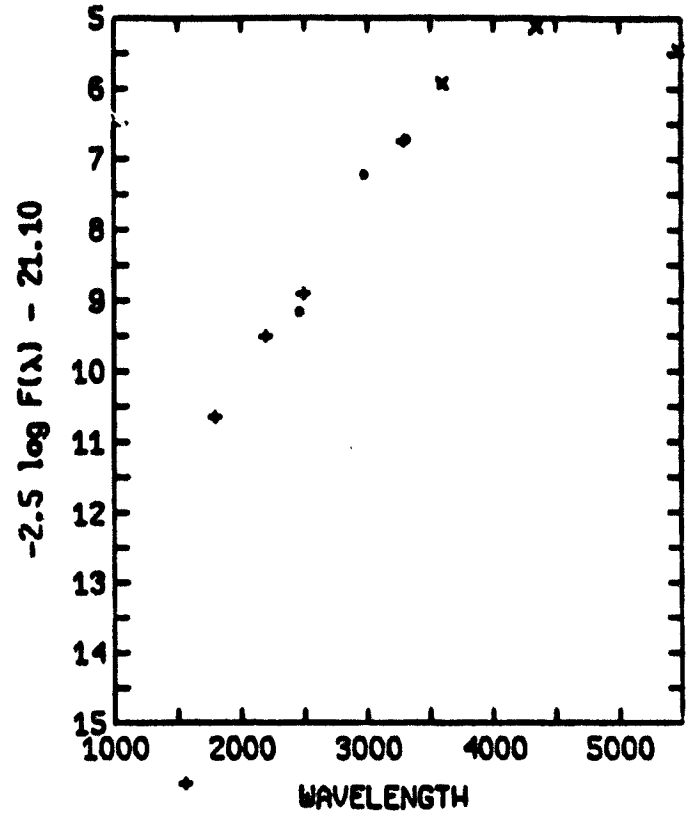




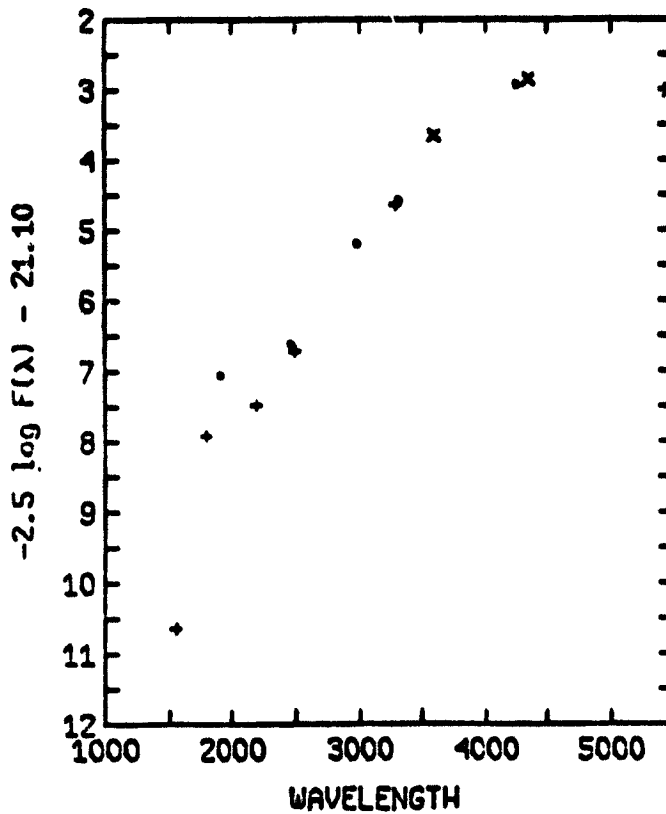
HC 432 BET CAS F2III-IV

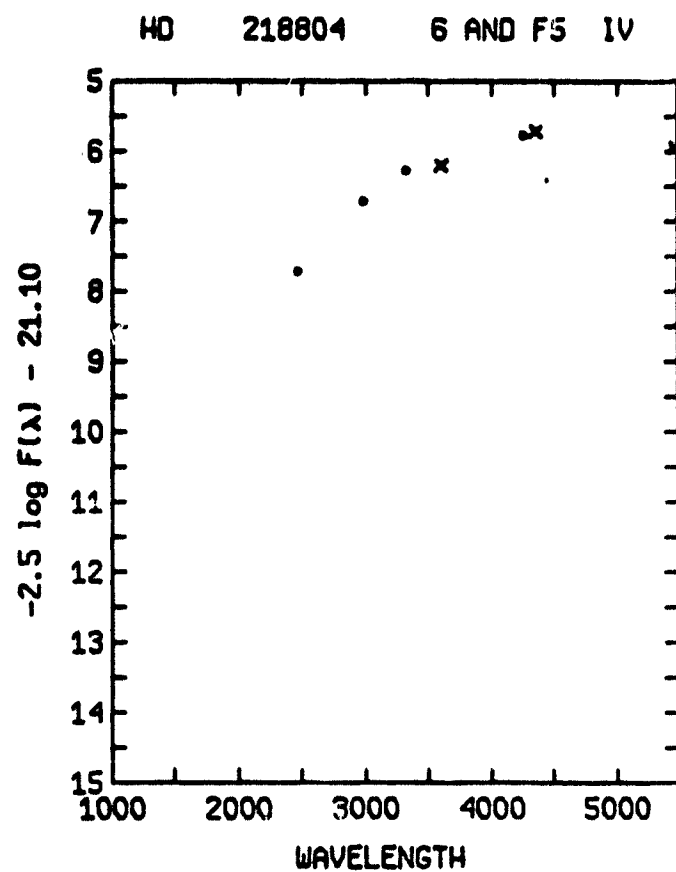
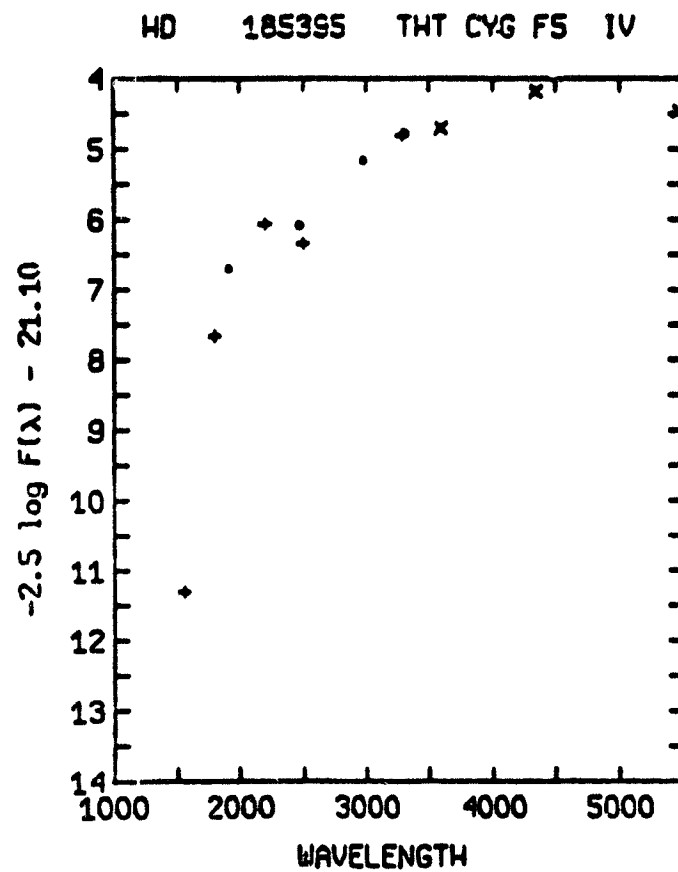
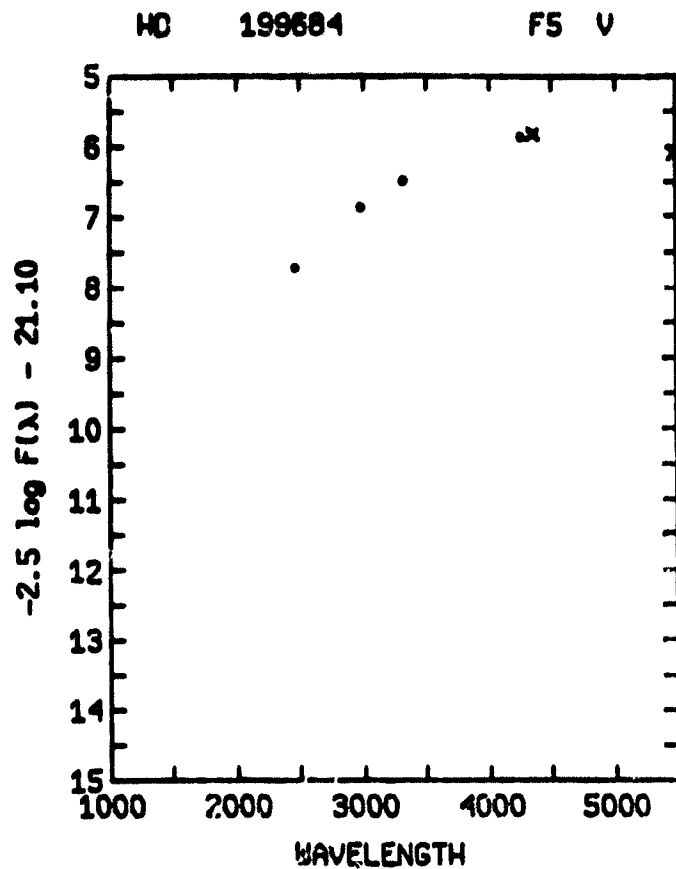
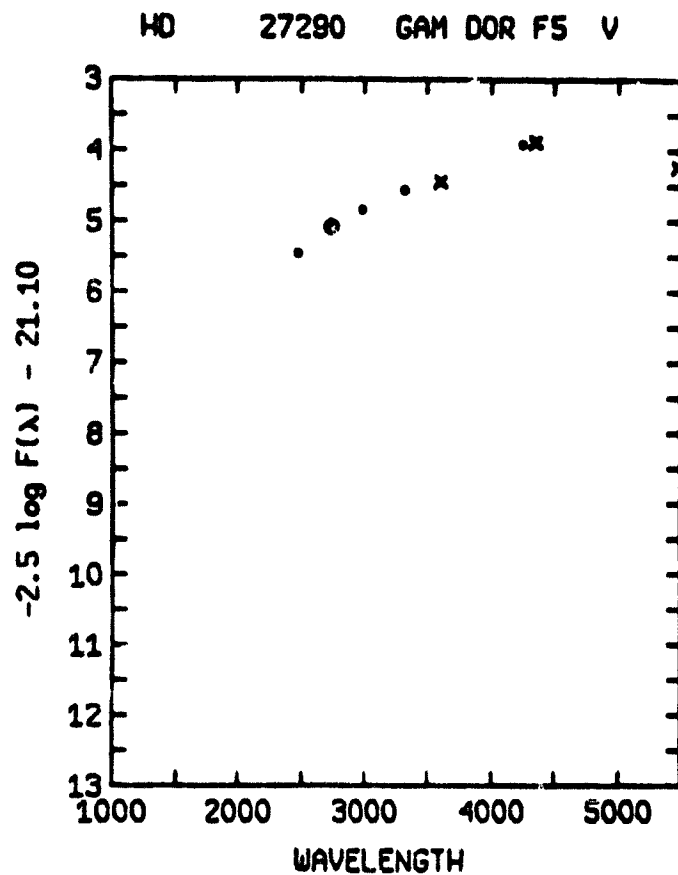


HD 163506 89 HER F2 IA

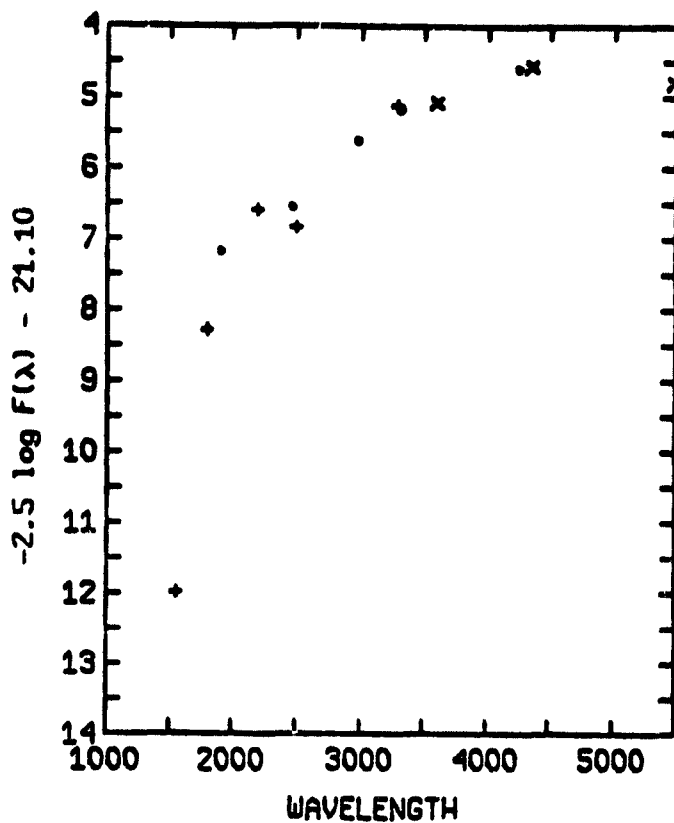


HD 161471 10T1SCO F2 IA

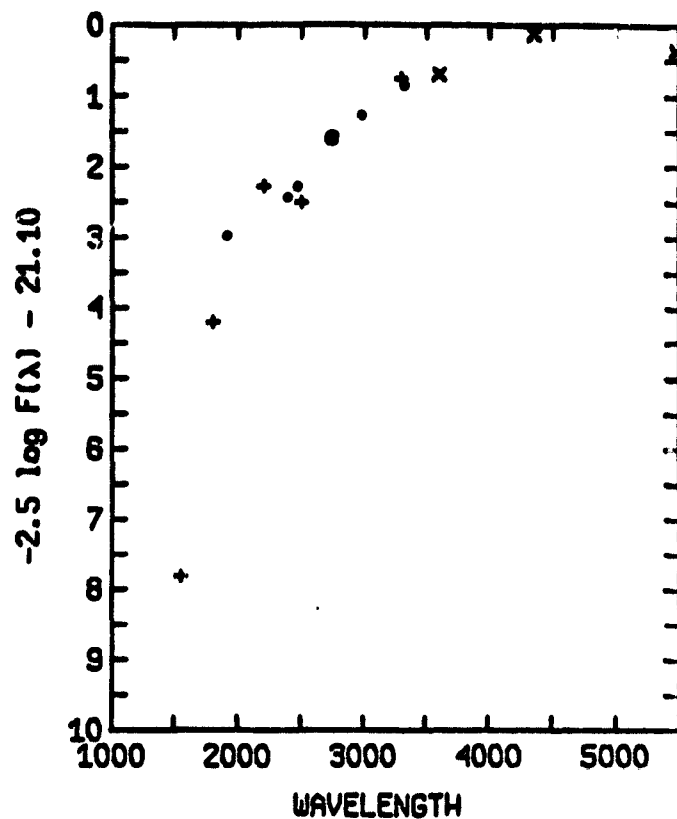




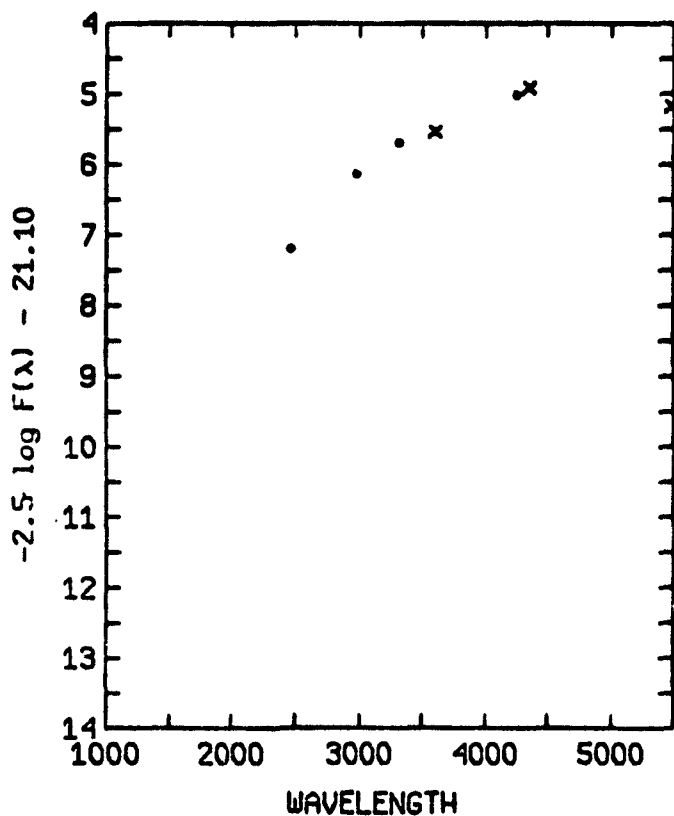
HD 160922 DMG DRA F5 V



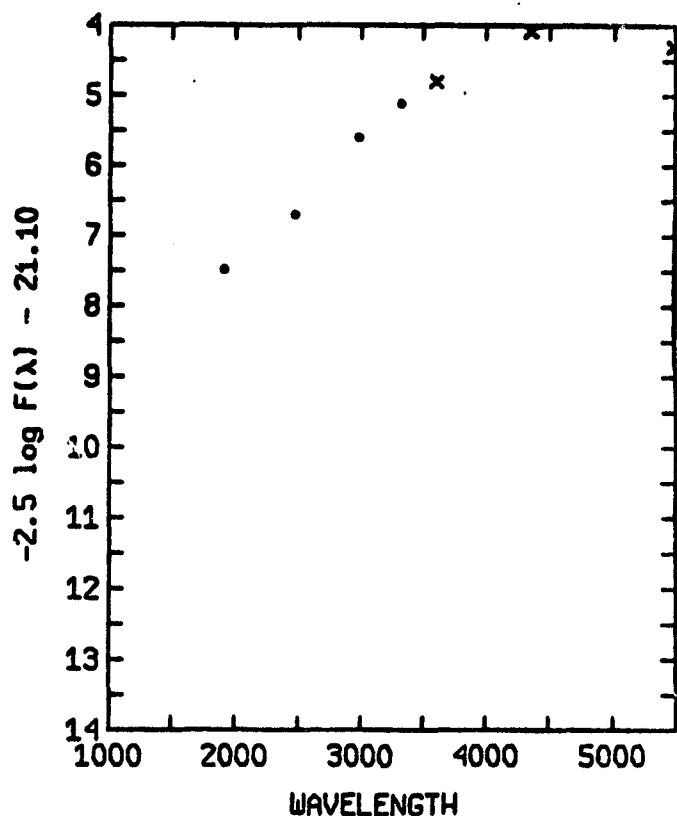
HD 61421 ALF CMI F5 IV-V



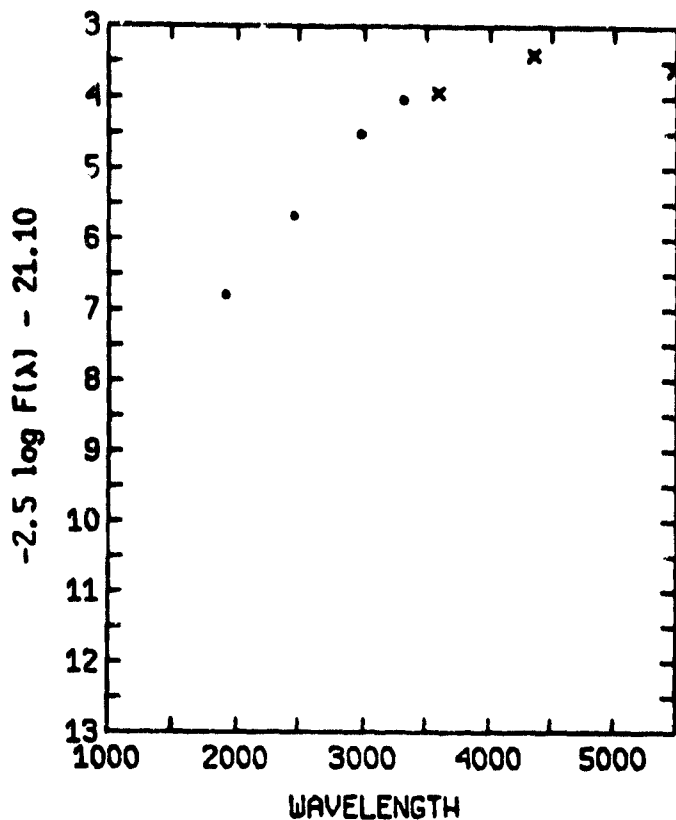
HD 1671 RHO AND F5 IV



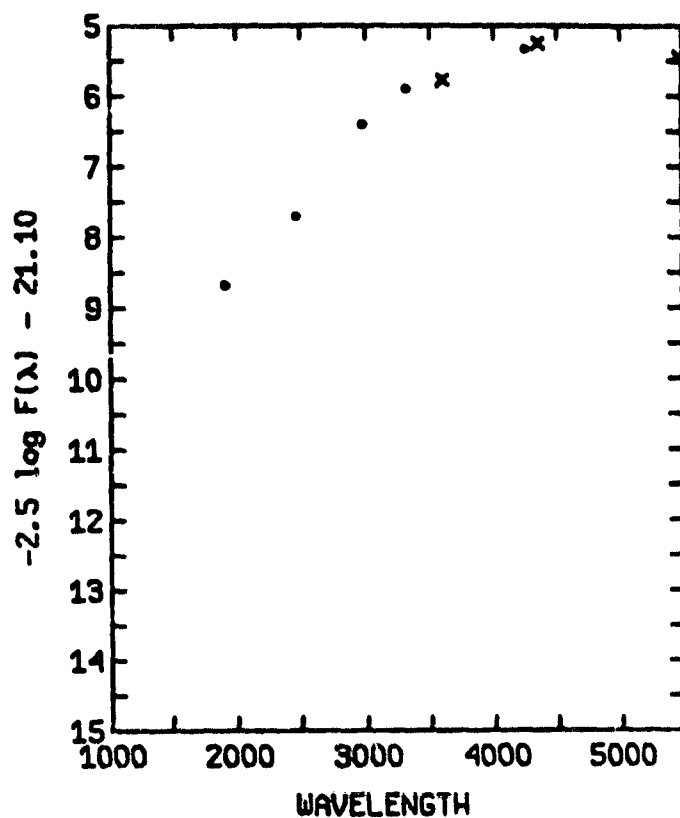
HD 210459 PI PEG F5II-III



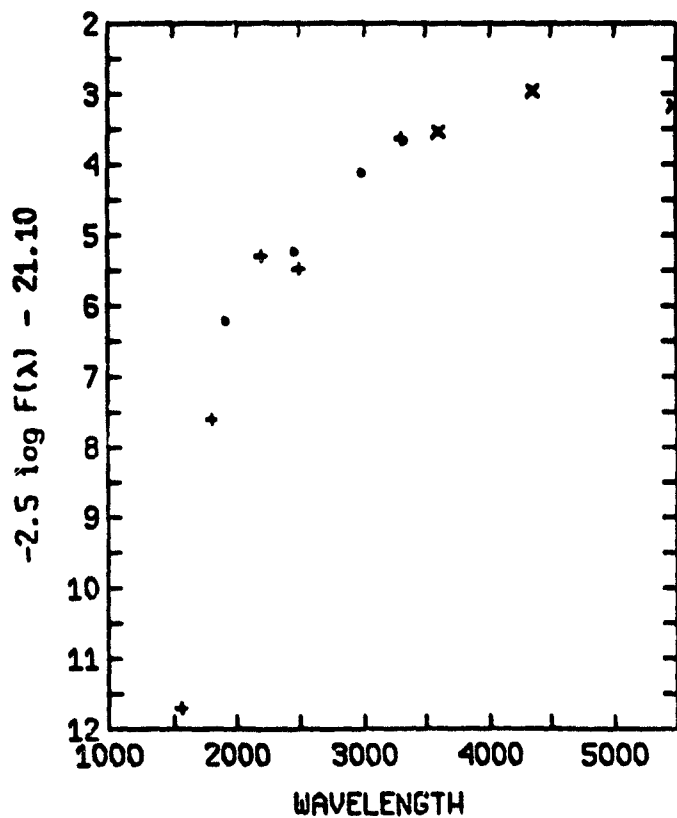
HD 38392/3 GAM LEP F6 V



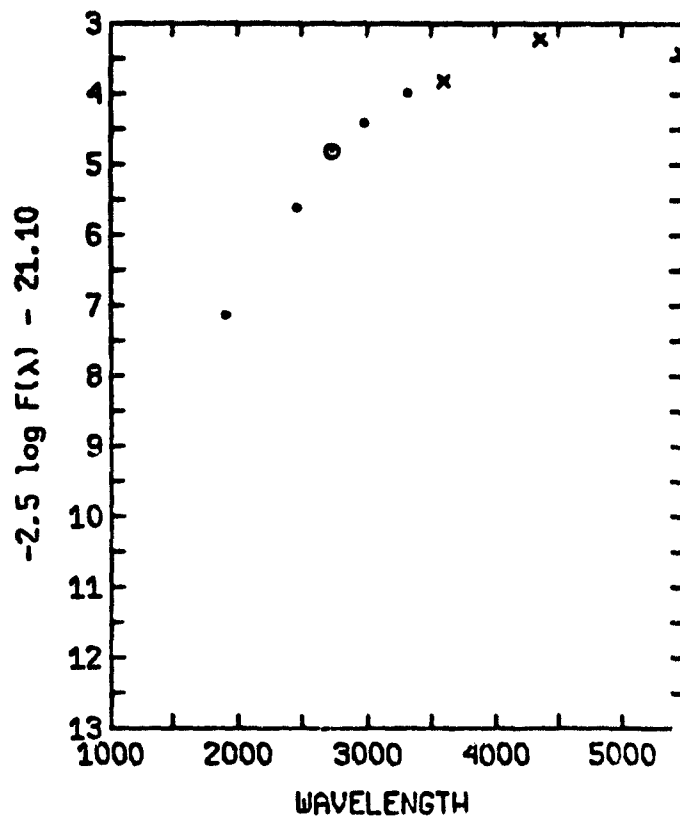
HD 46588 D F6

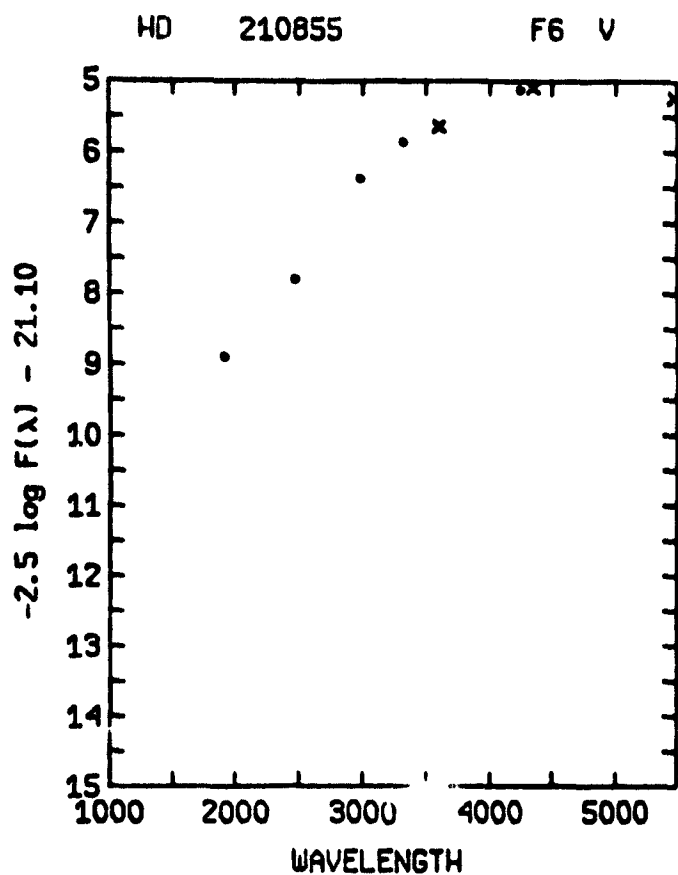


HD 82328 THT UMA F6 IV

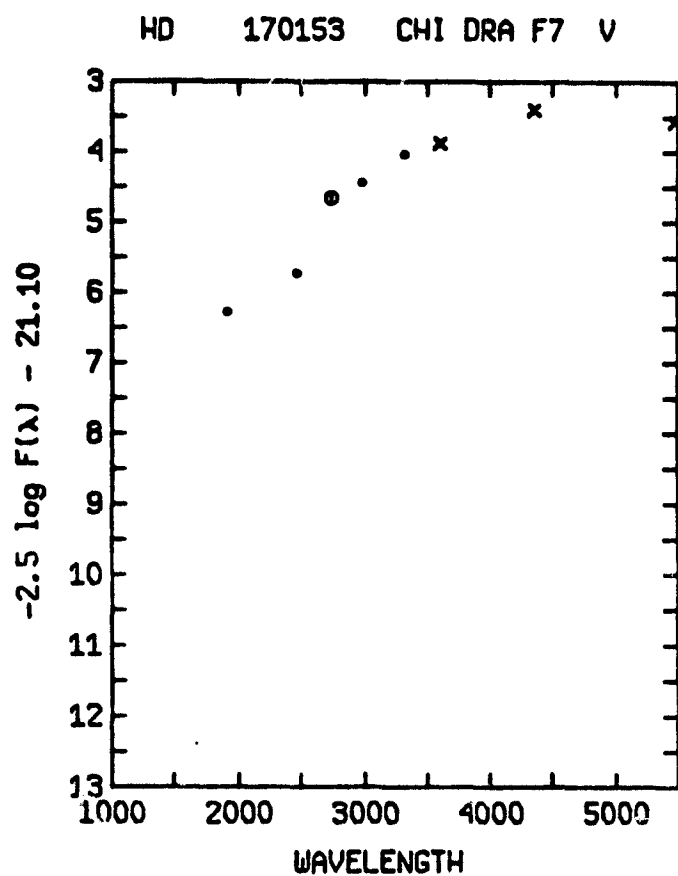
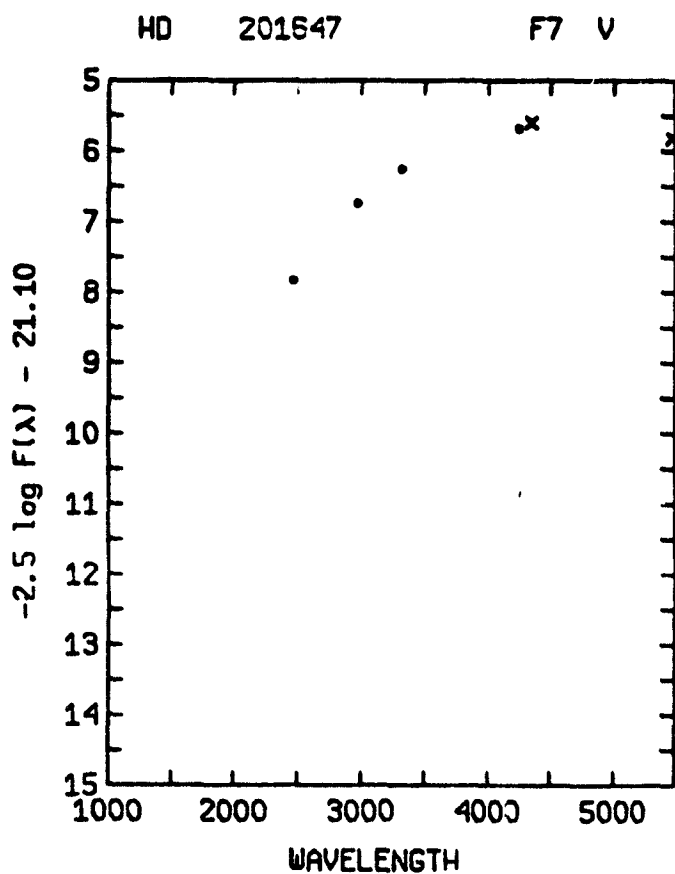


HD 11443 ALF TRI F6 IV



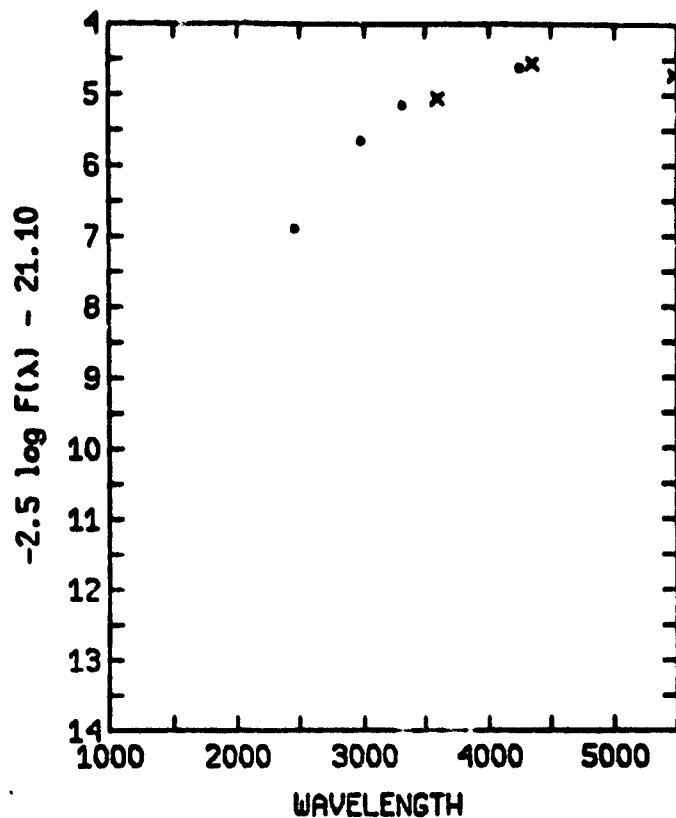


F7 stars
III-III2



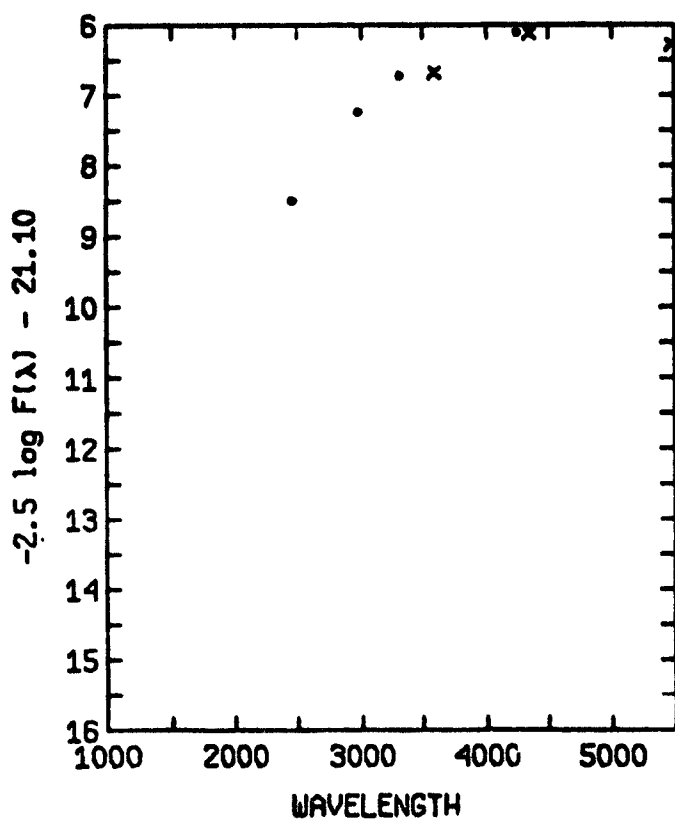
F7 stars
II3

HD 33262 ZET DOR F7 V

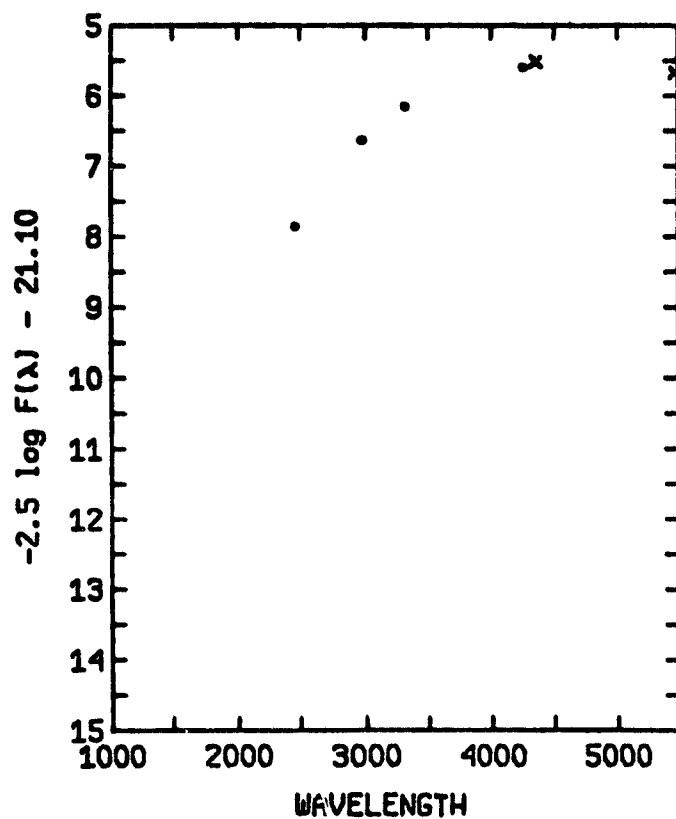


F8-9 stars
JJ1-JJ2

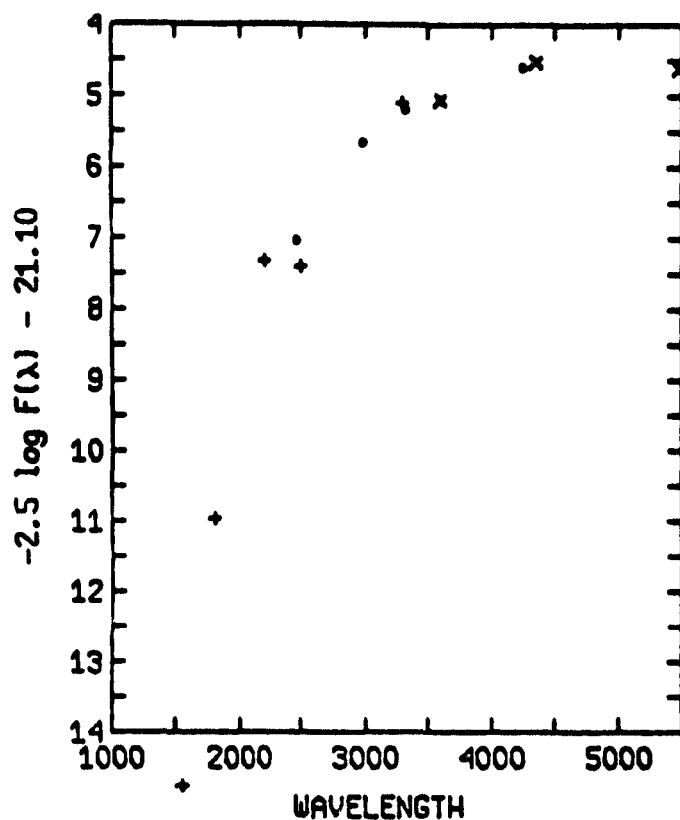
HD 31975 F8 V



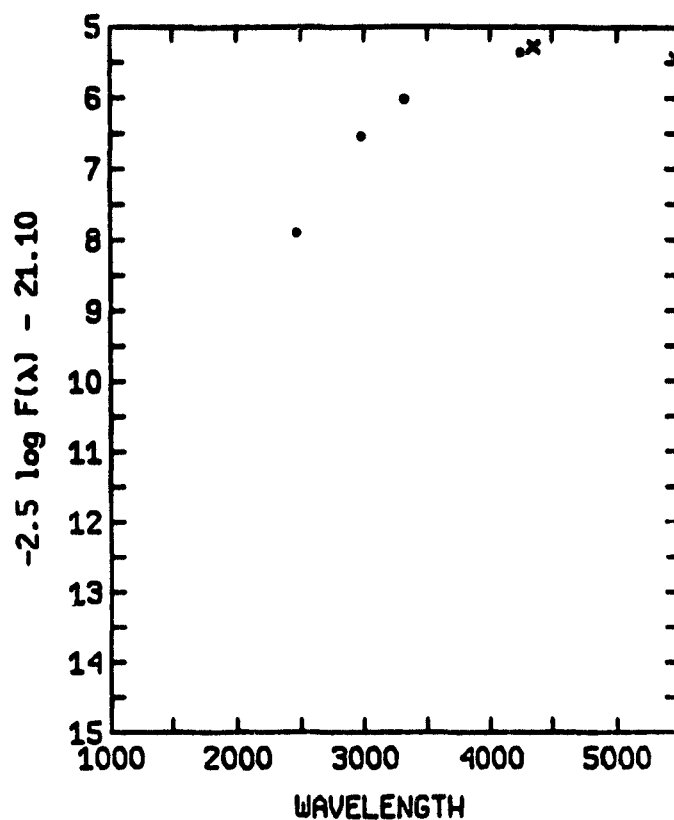
HD 199260 F8 V



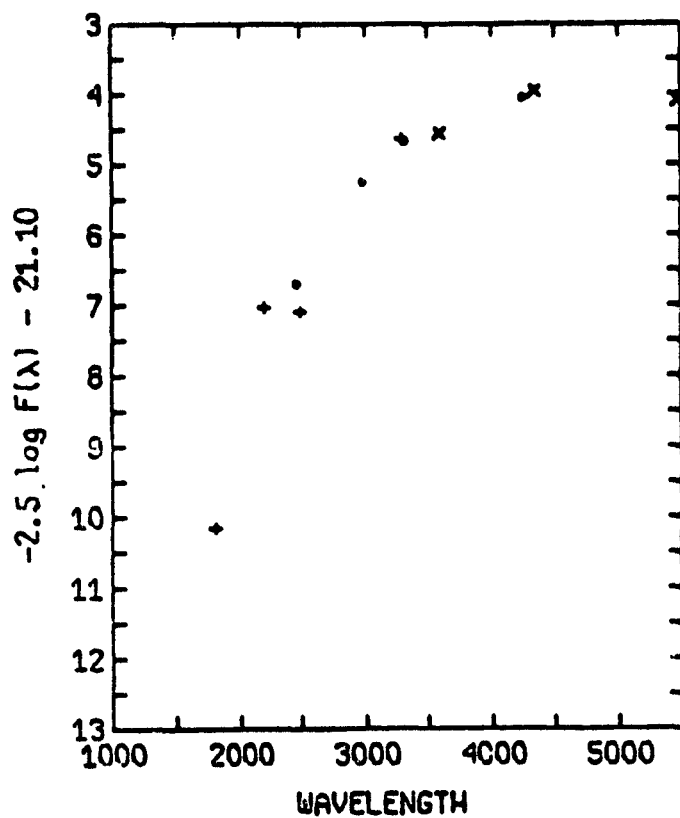
HD 142373 CHI HER F9 V



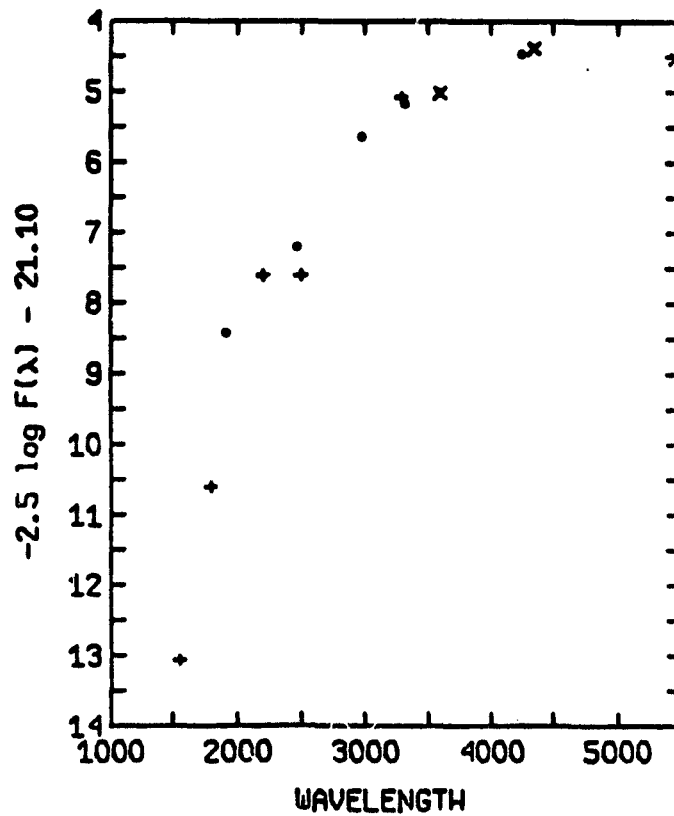
HD 35072 ZET PIC F8 III



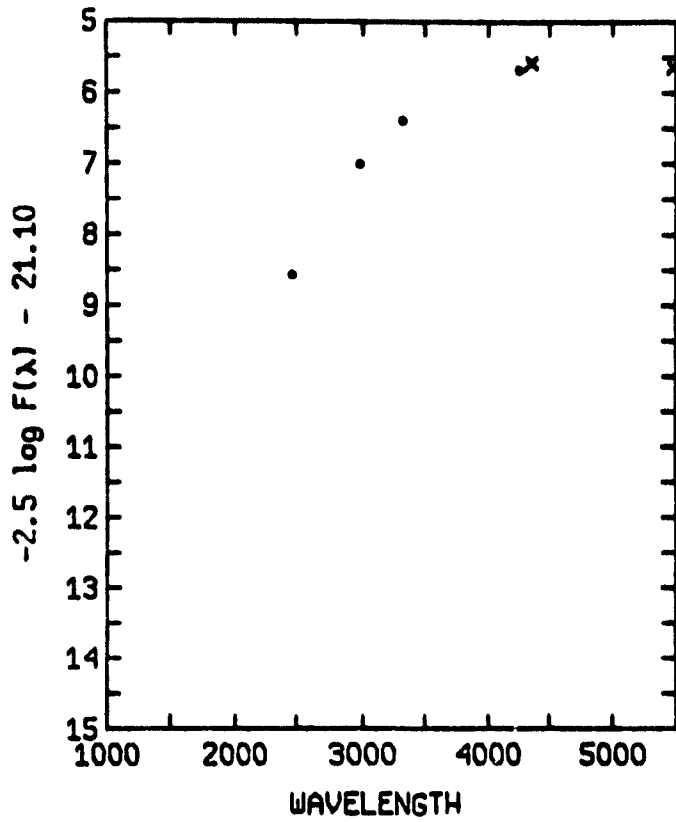
HD 9826 UPS AND F8 V



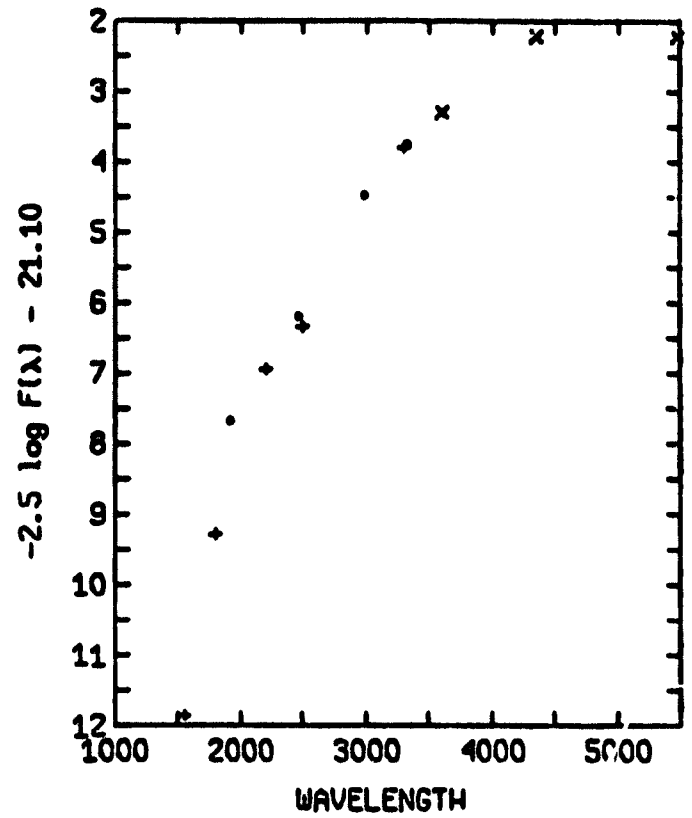
HD 198084 F8 IV



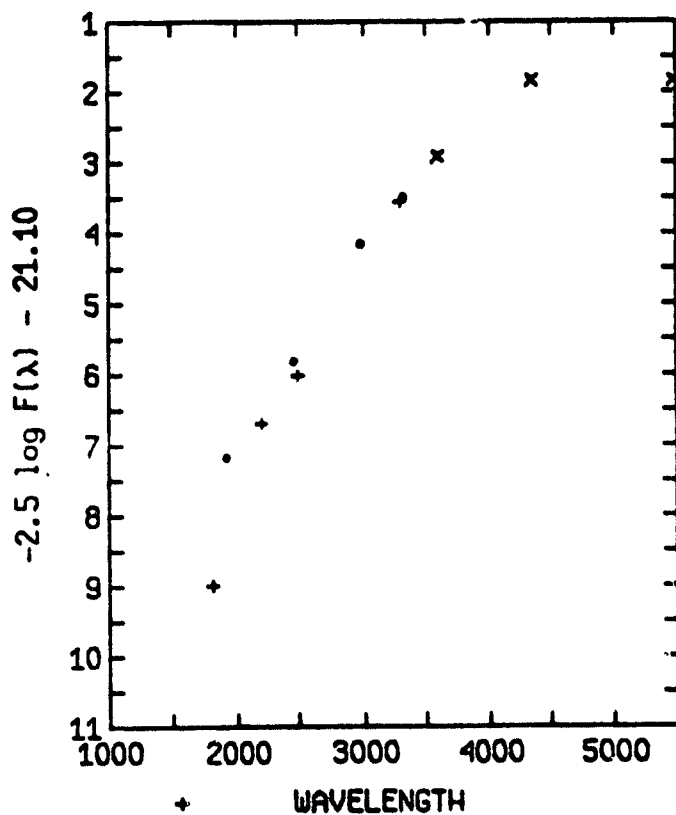
HD 6920 44 AND F8 V

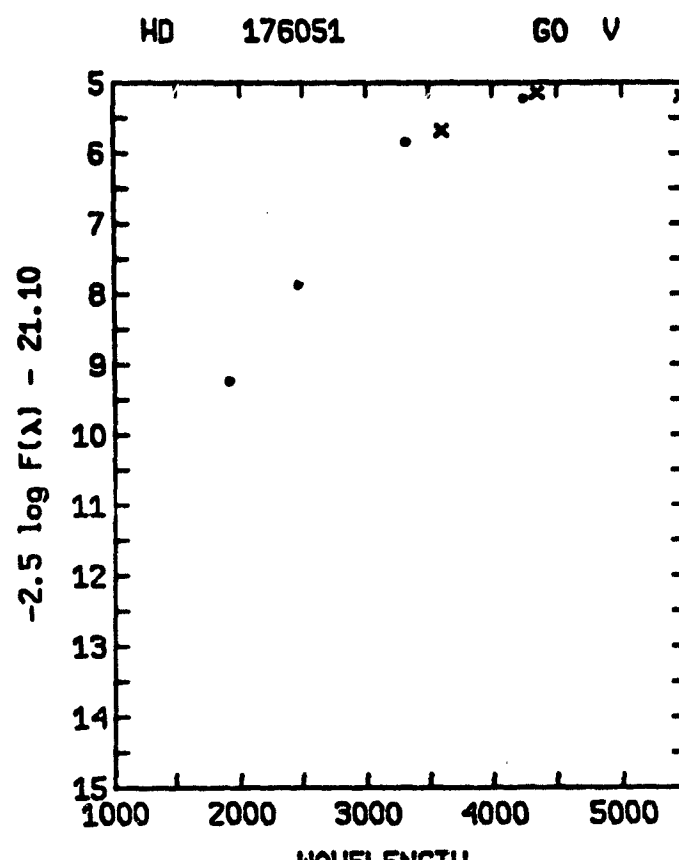
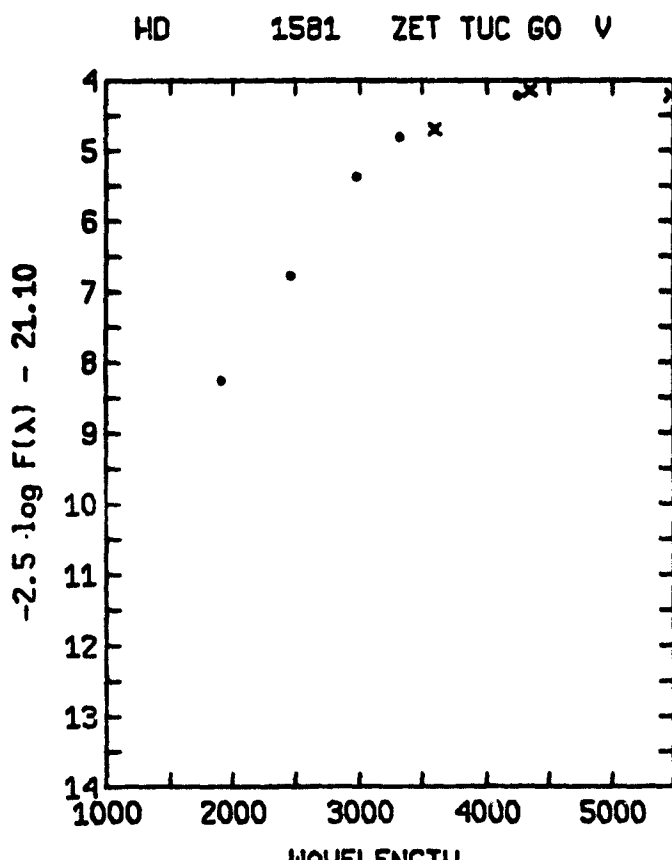
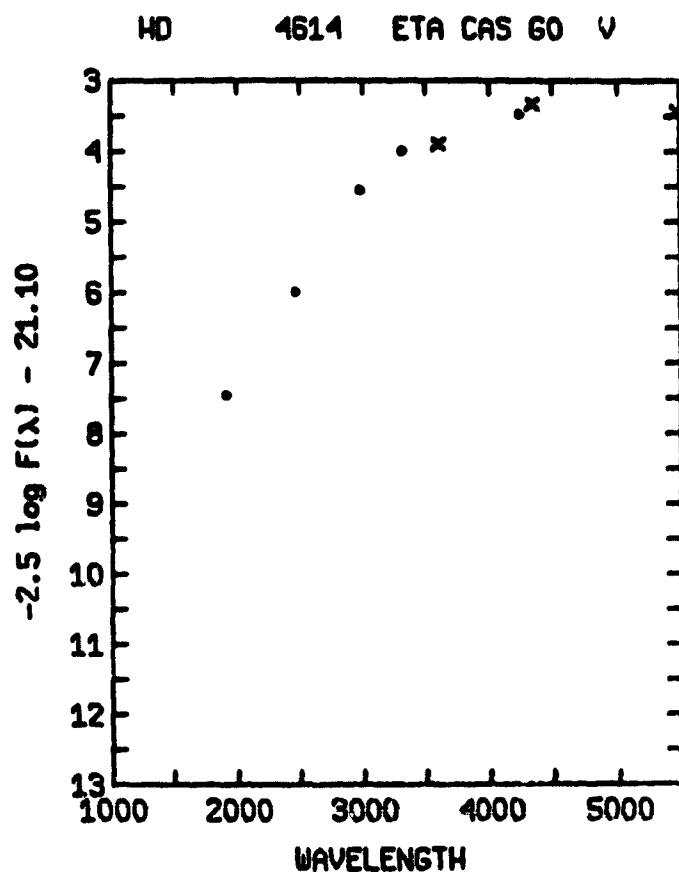
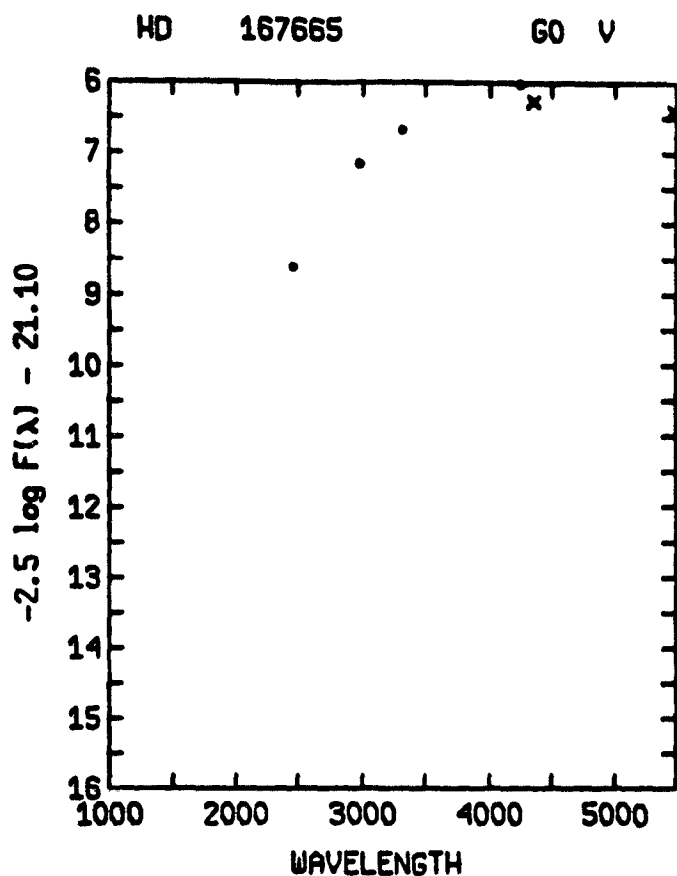


HD 194093 GAM CYG F8 IB

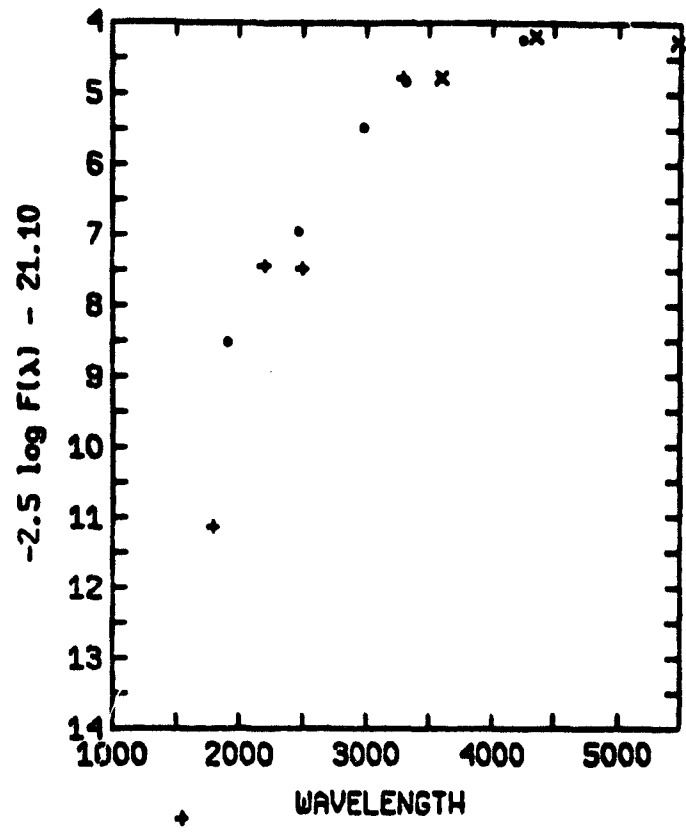


HD 54605 DEL CMA F8 IA

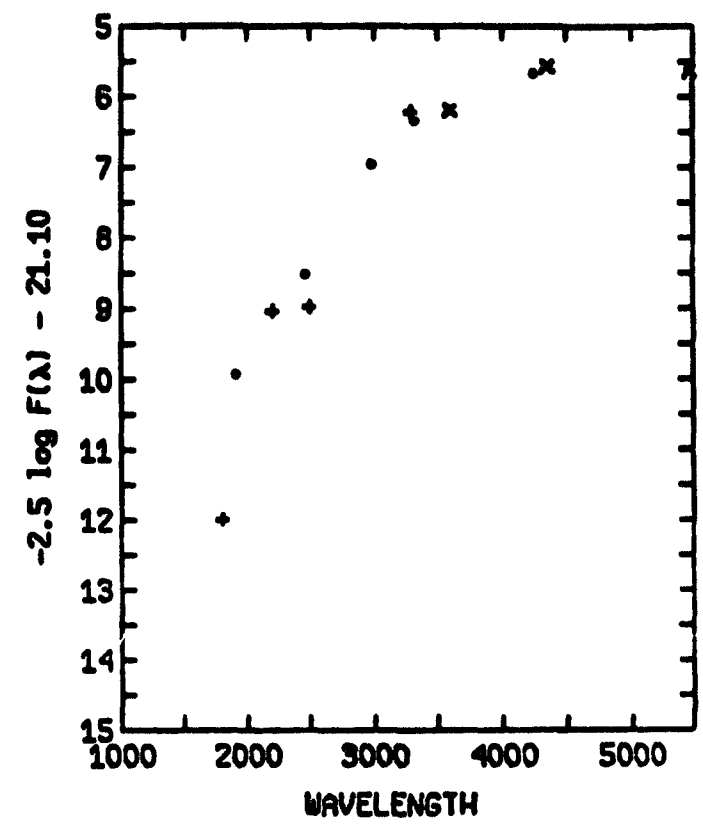




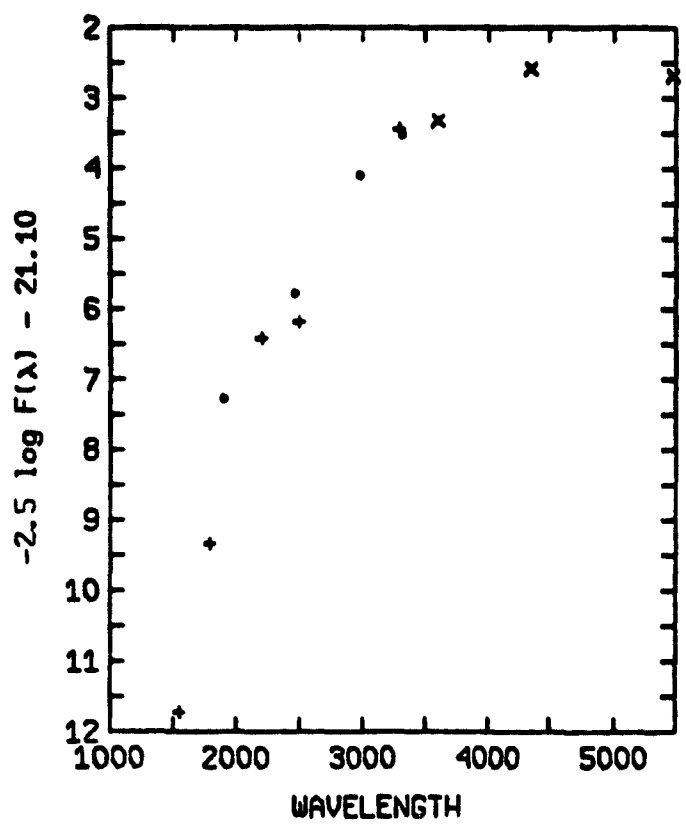
HD 109358 BET CVN GO V



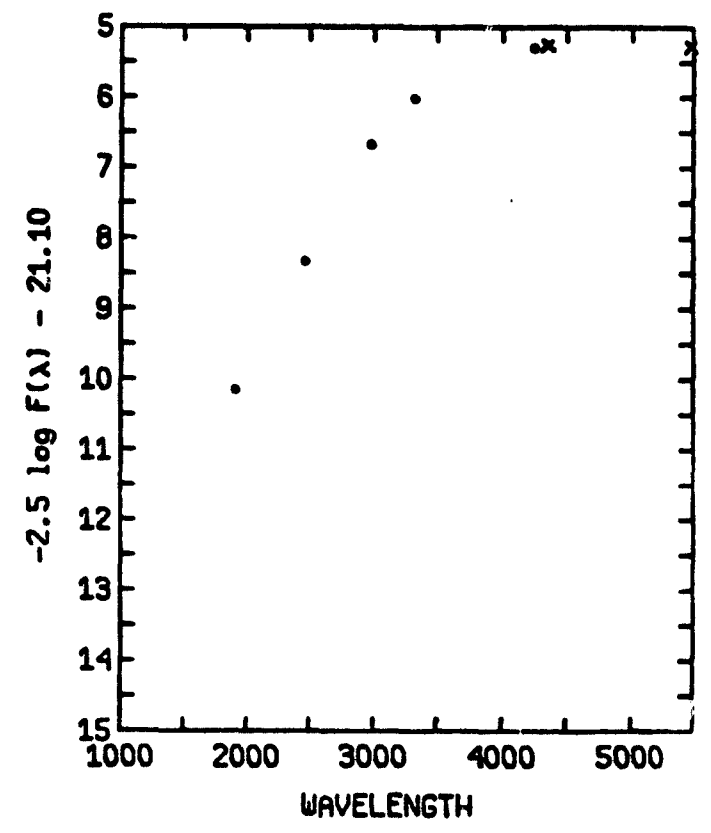
HD 72905 P11 UMA GO V

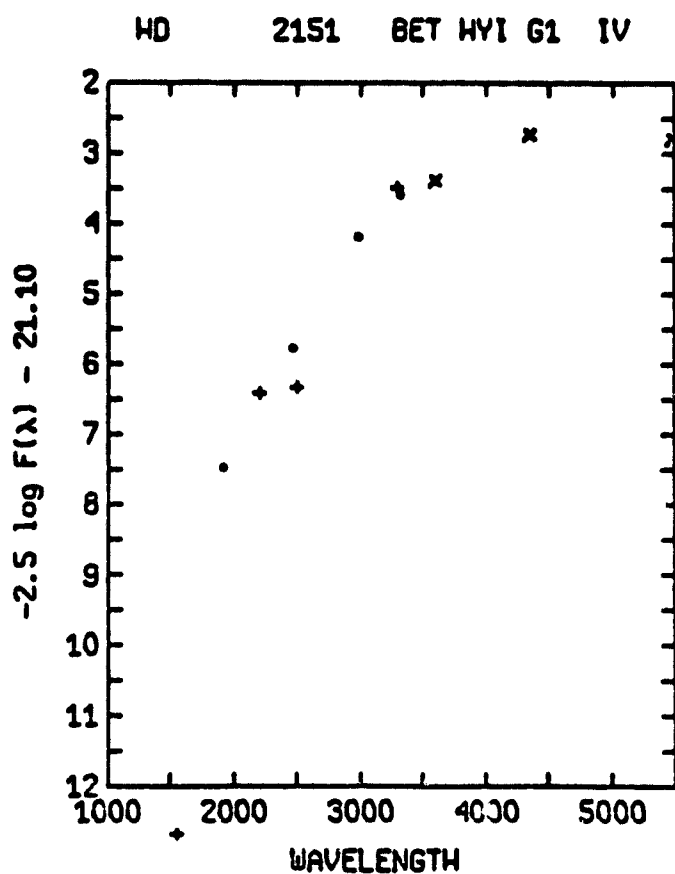
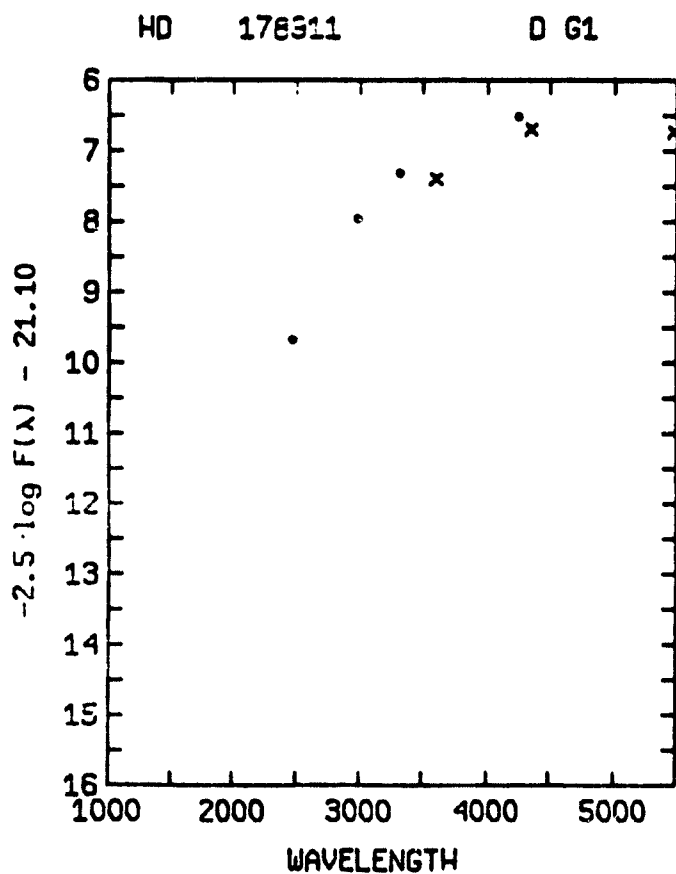
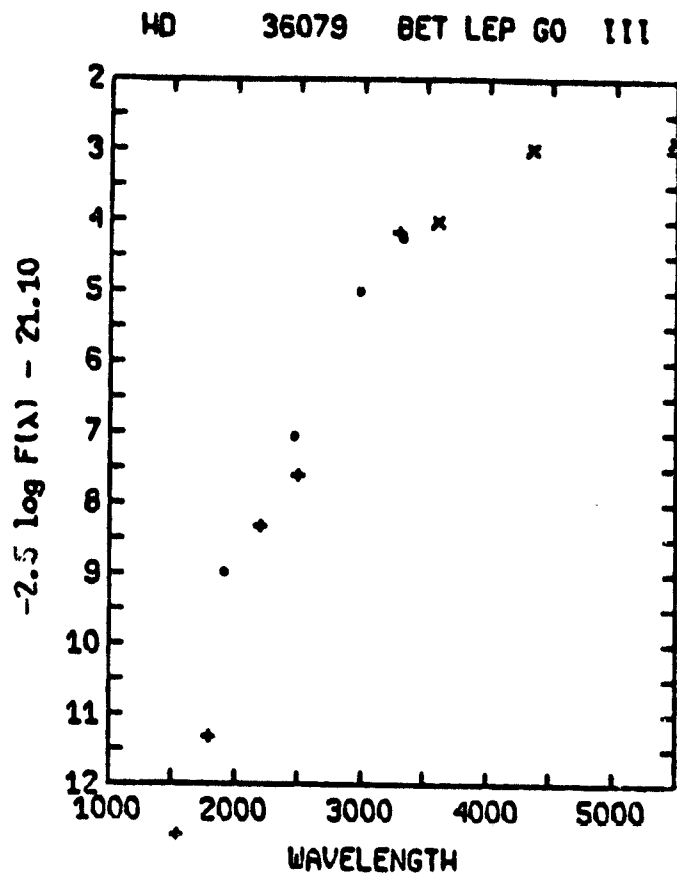
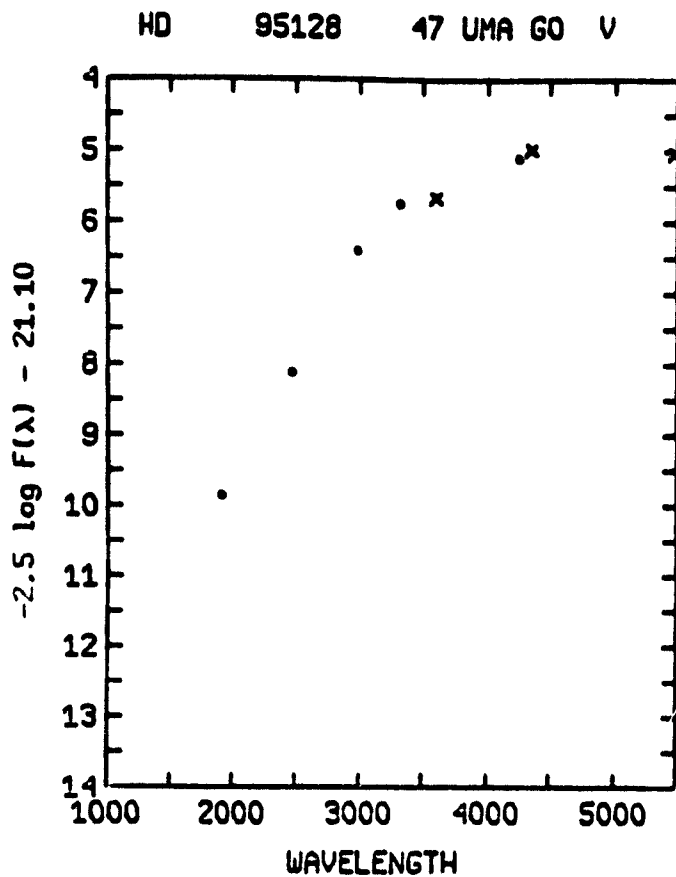


HD 121370 ETA BOO GO IV



HD 53705/6 GO

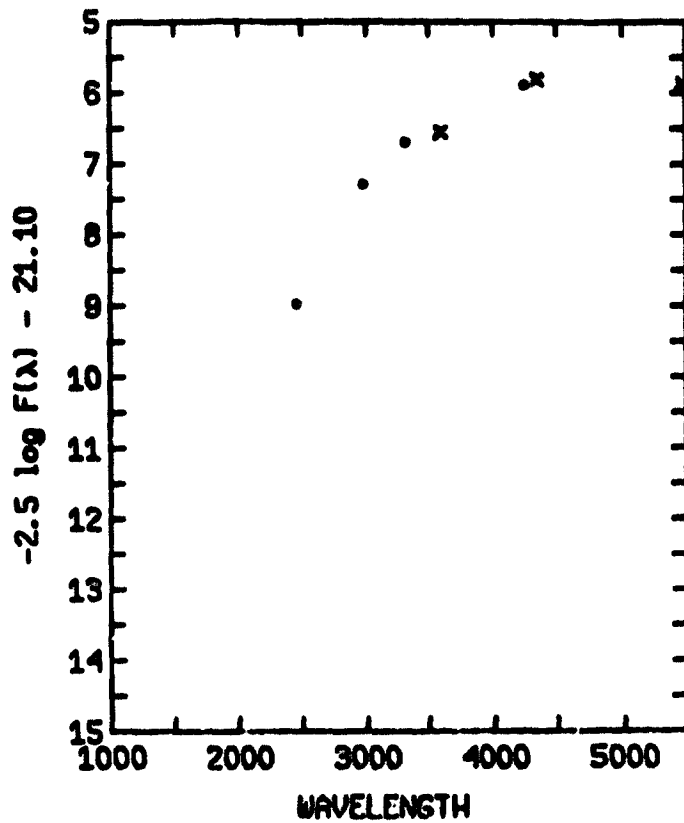
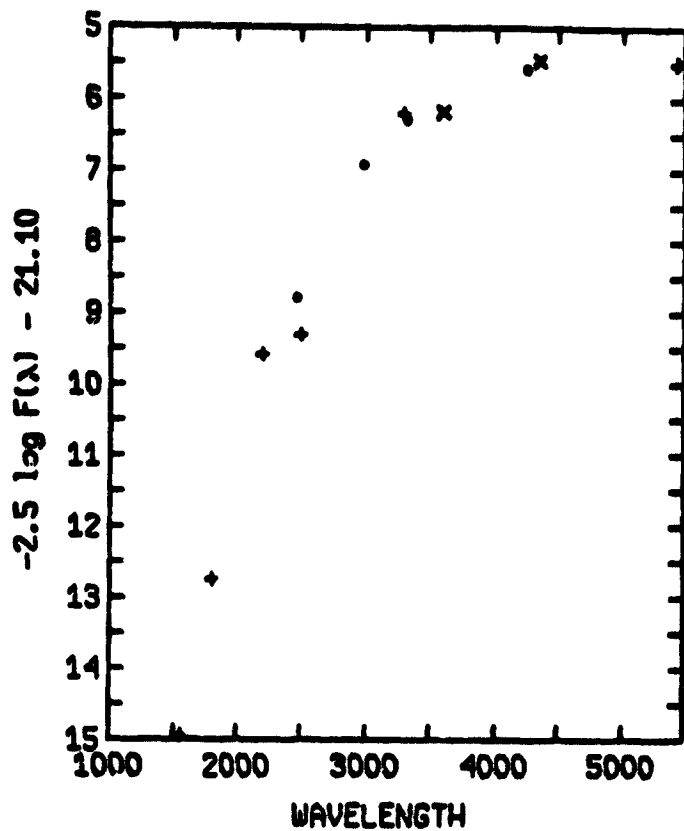




G1 stars
LL3-LL6

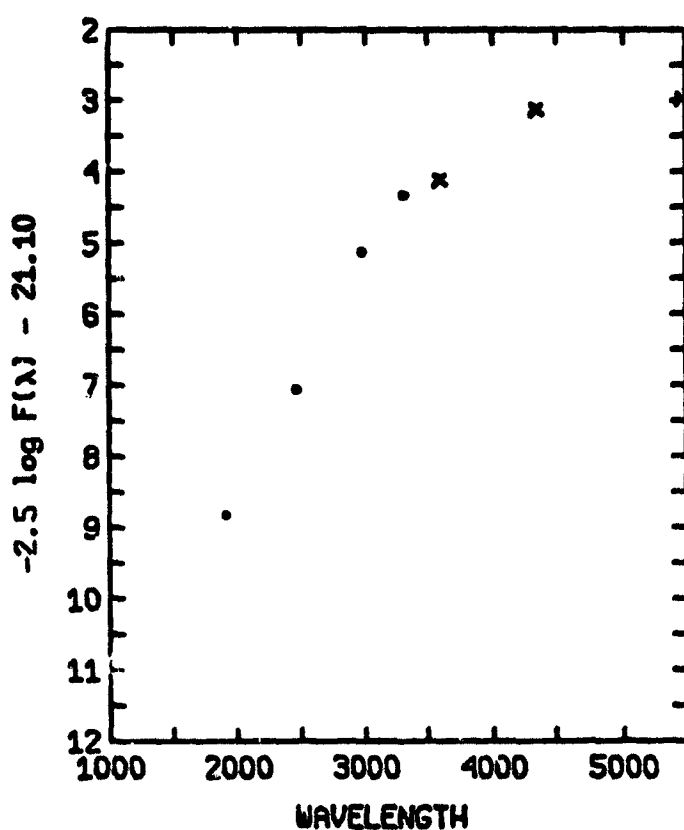
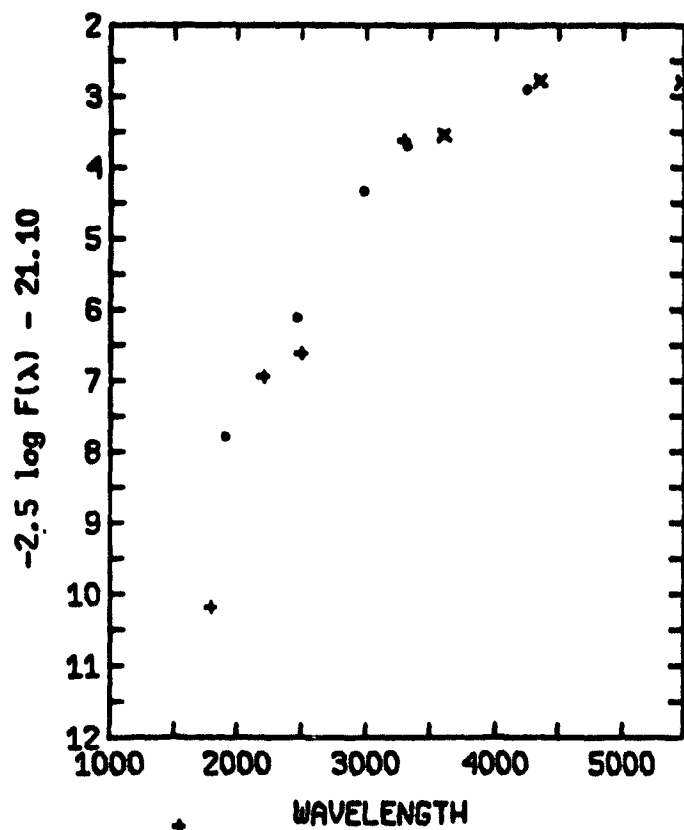
HD 146233 18 SCO D G1

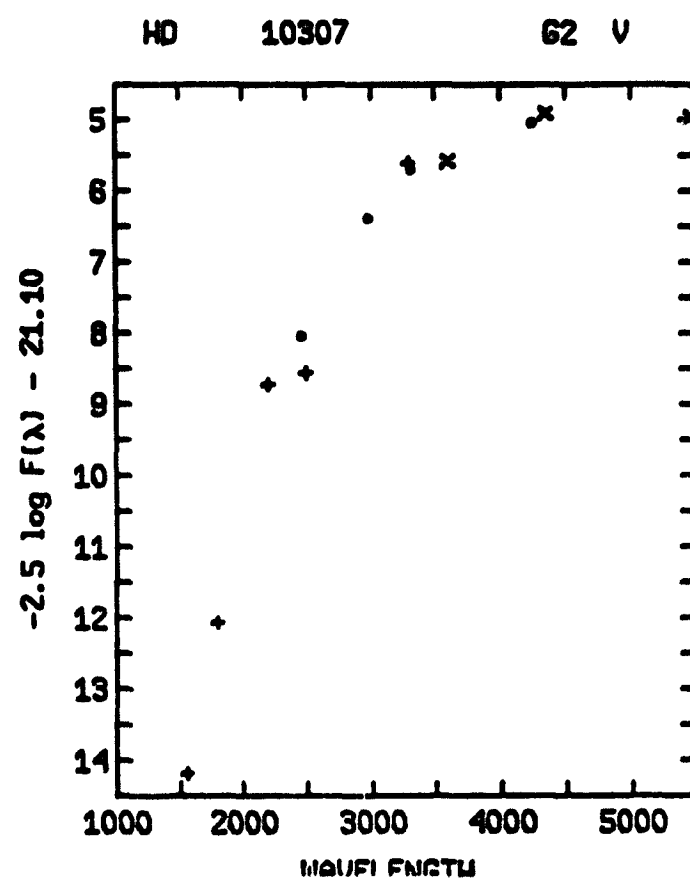
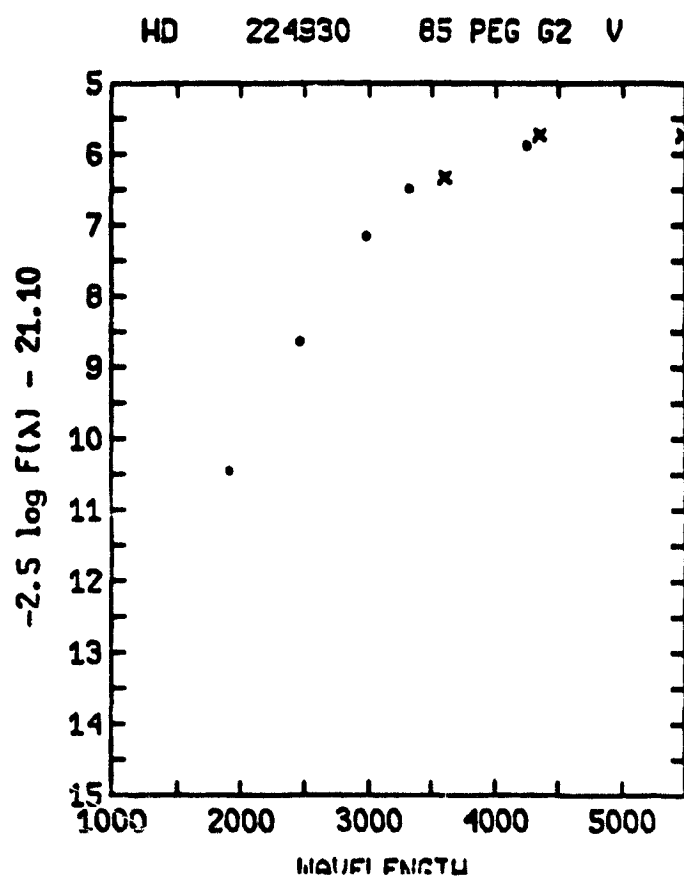
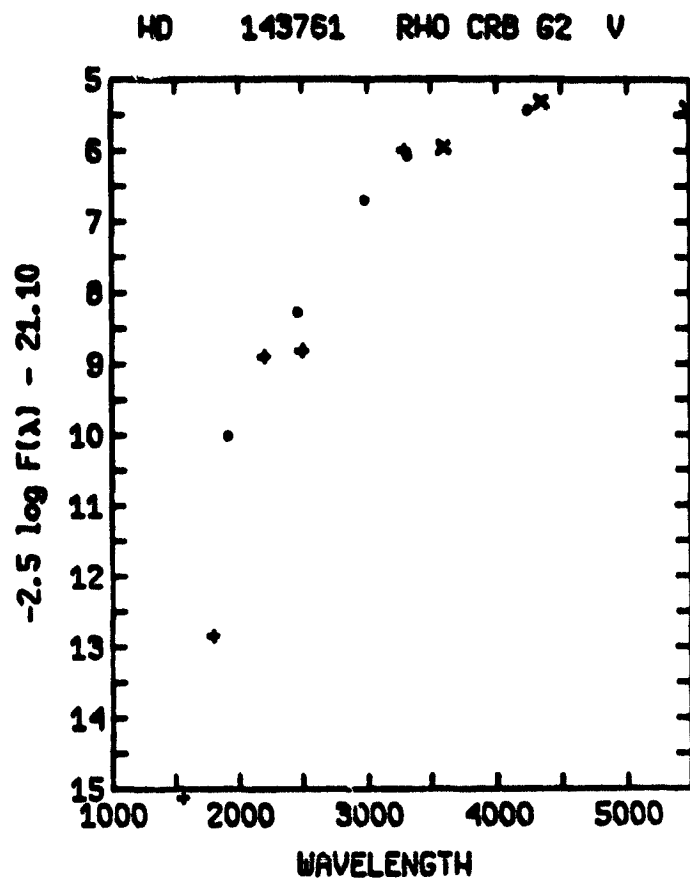
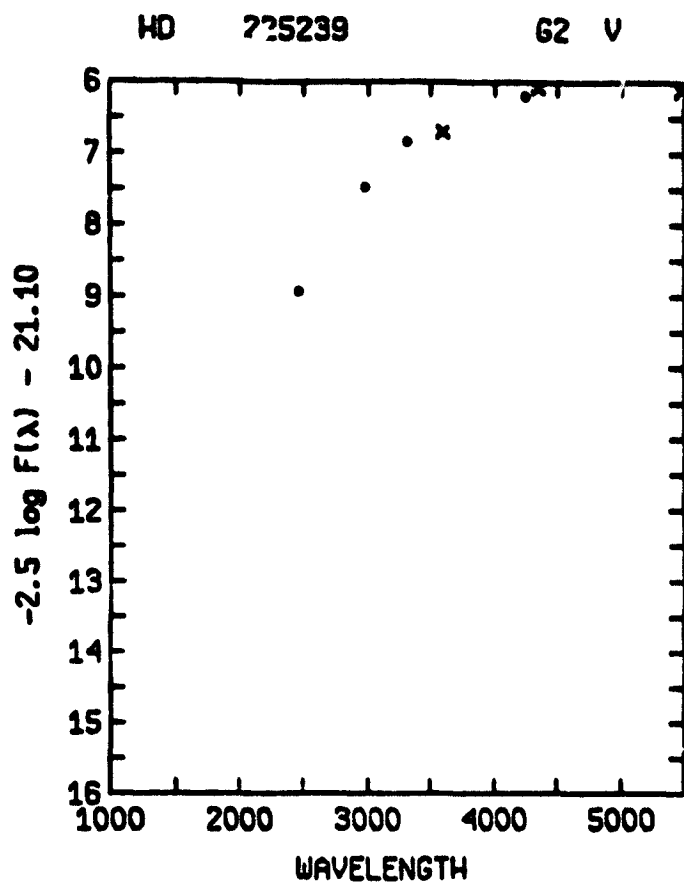
HD 12235 112 PSC D G1



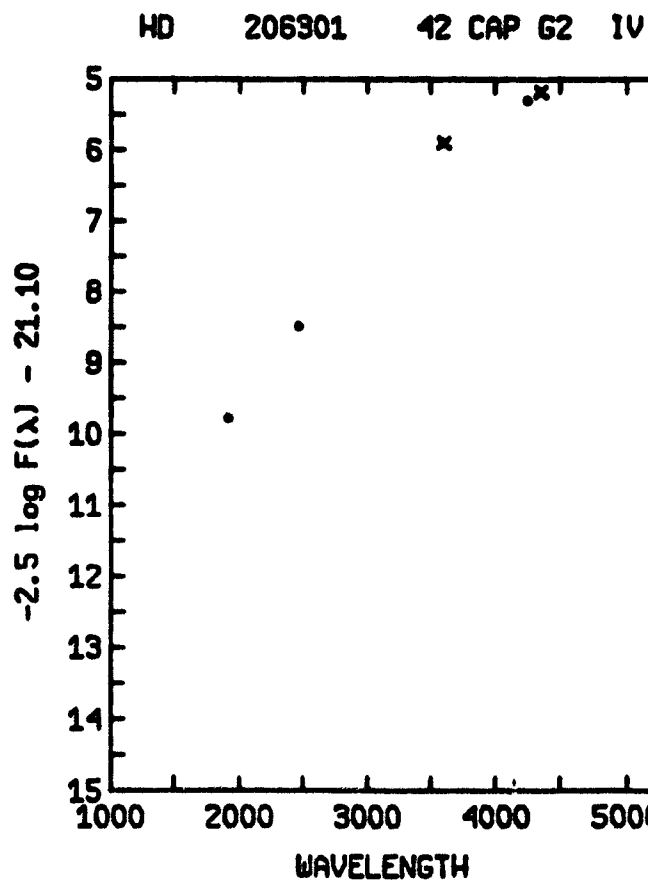
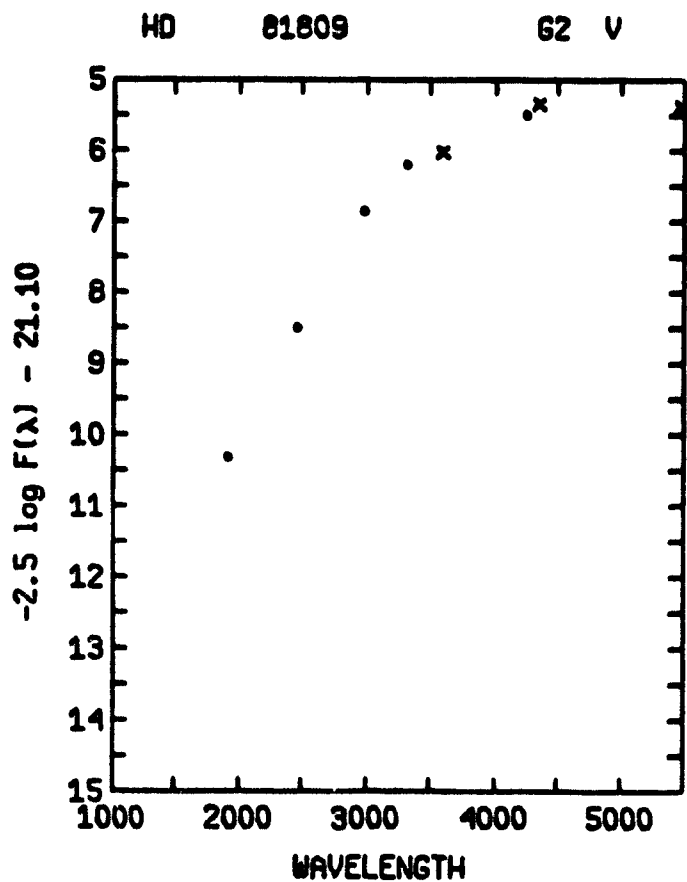
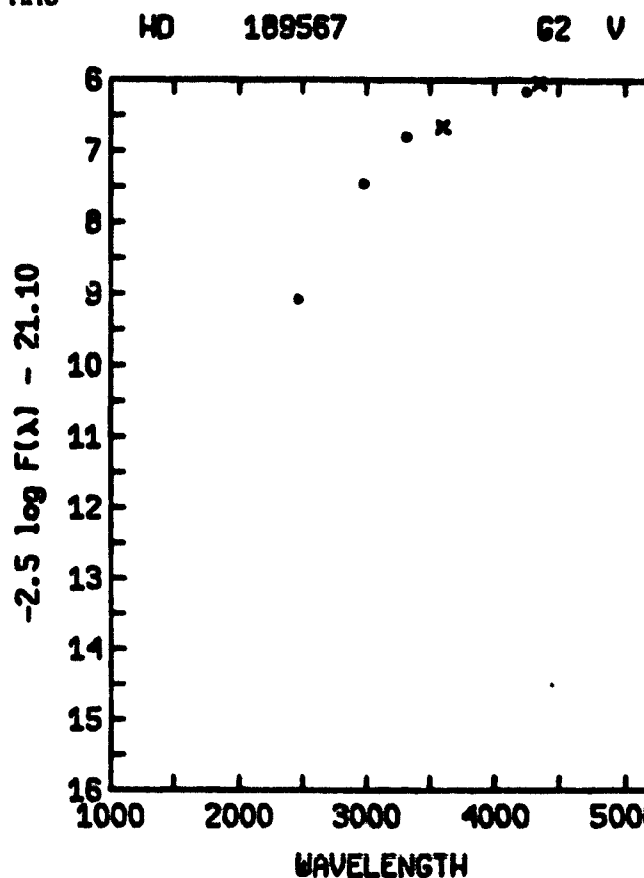
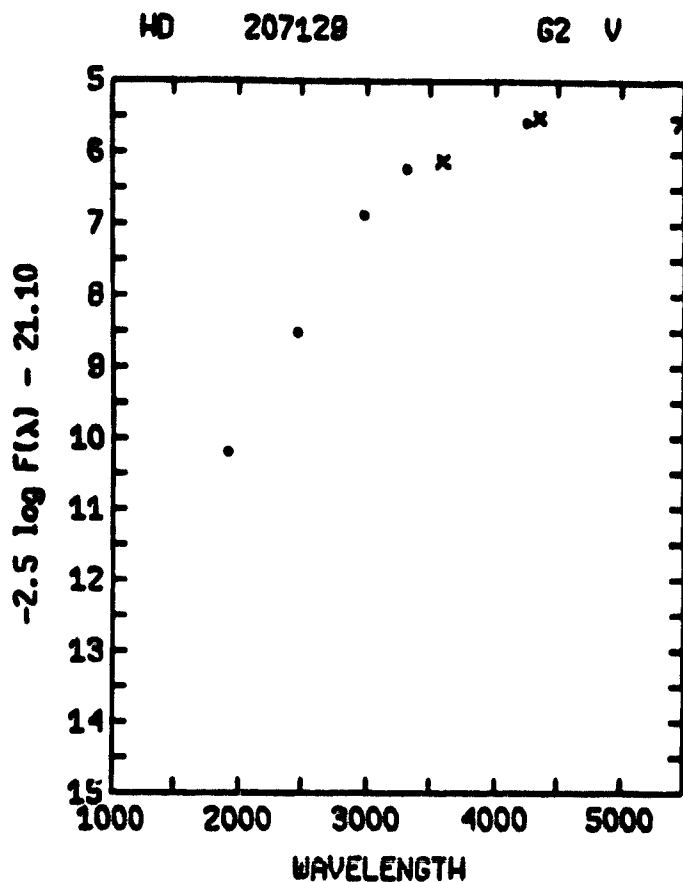
HD 150680 ZET HER G1 IV

HD 84441 EPS LEO G1 II



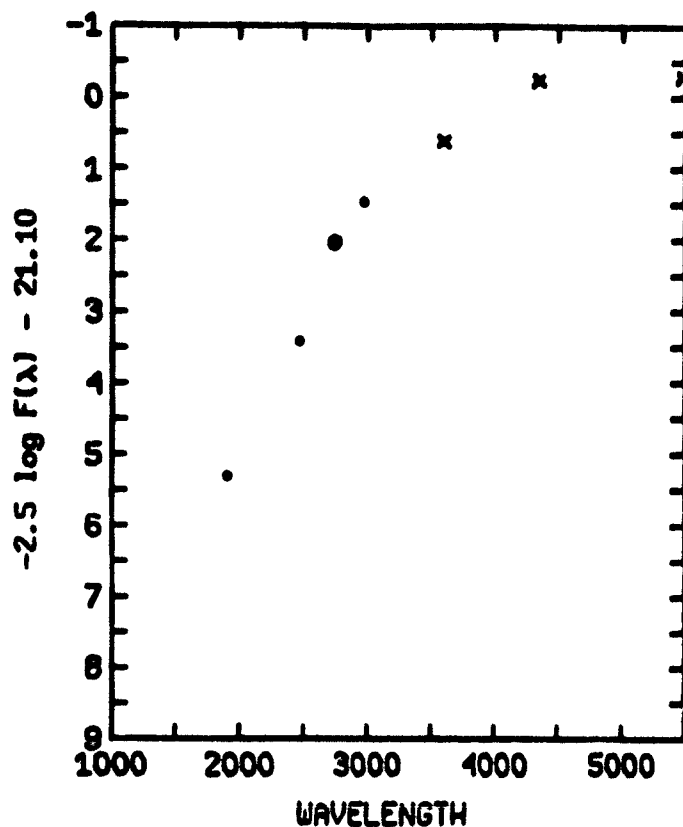


G2 stars
MM5-MM8

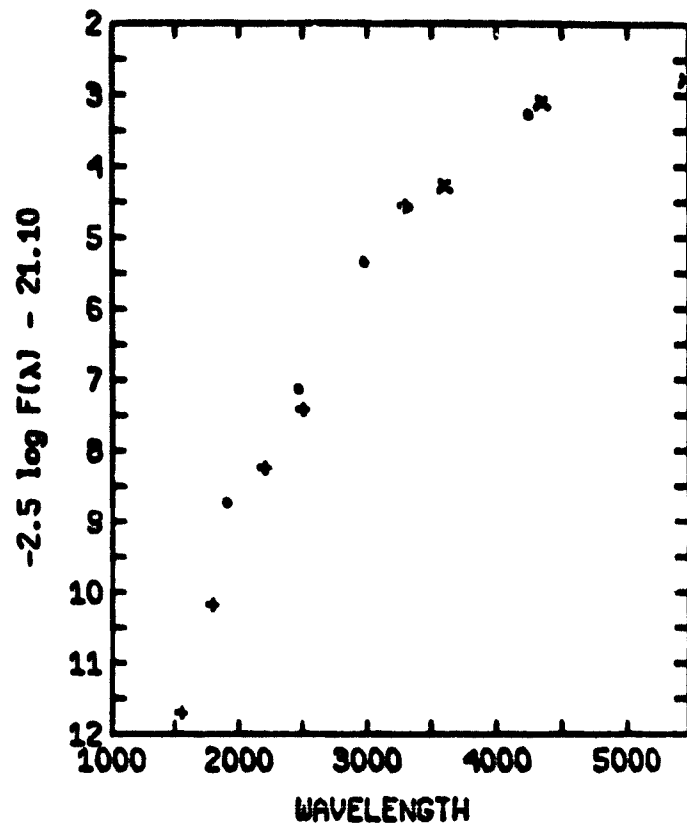


G2 stars
MM9-MM10

HD 128520/1 ALF CEN G2 V

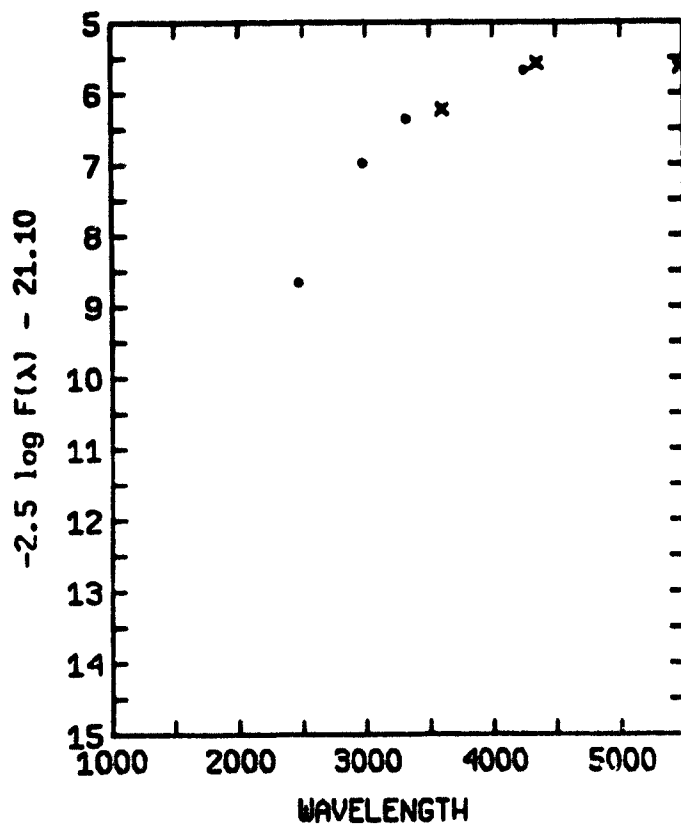


HD 159181 BET DRA G218-11A

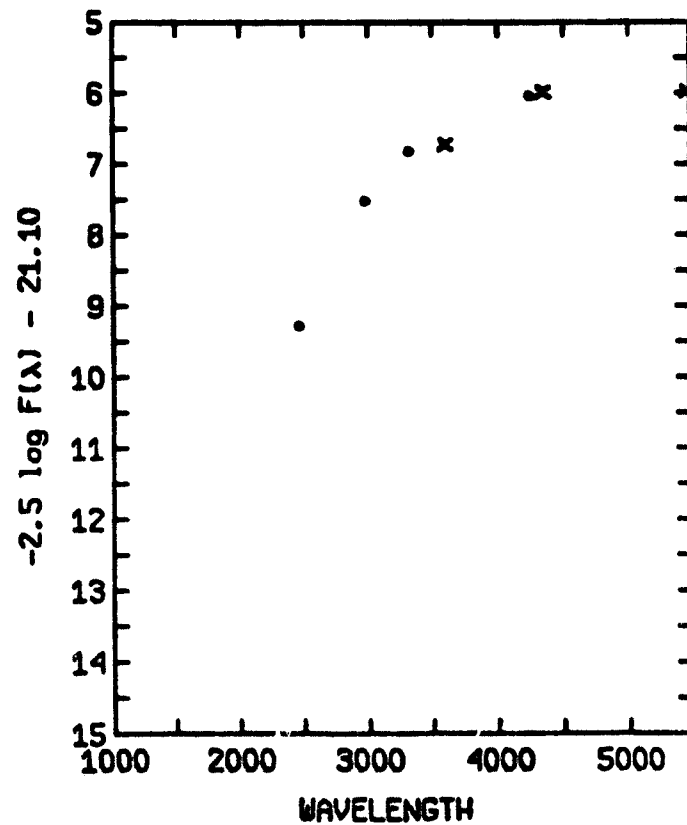


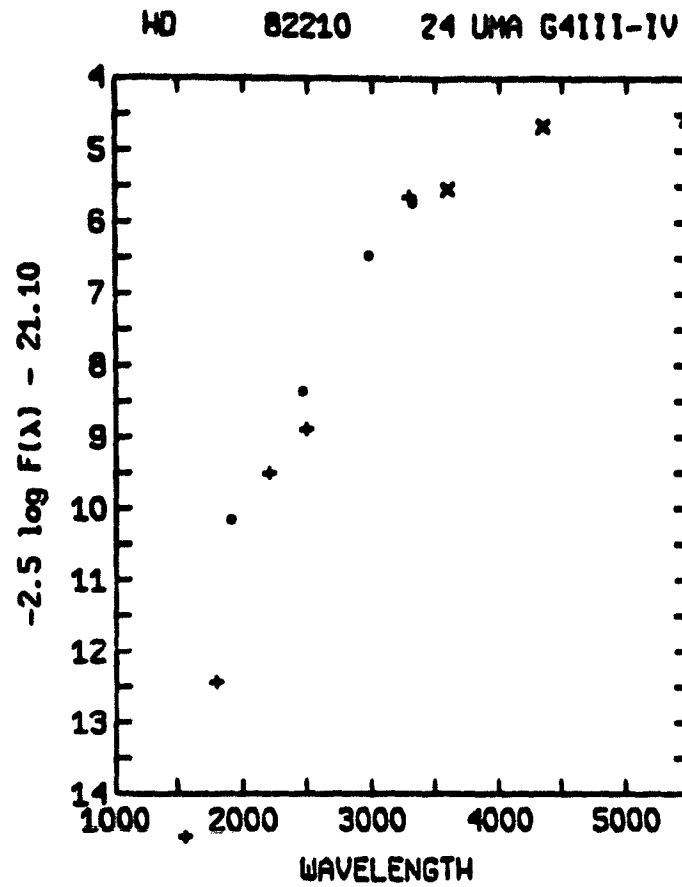
G3-4 stars
NN1-NN2

HD 39091 PI MEN G3 IV

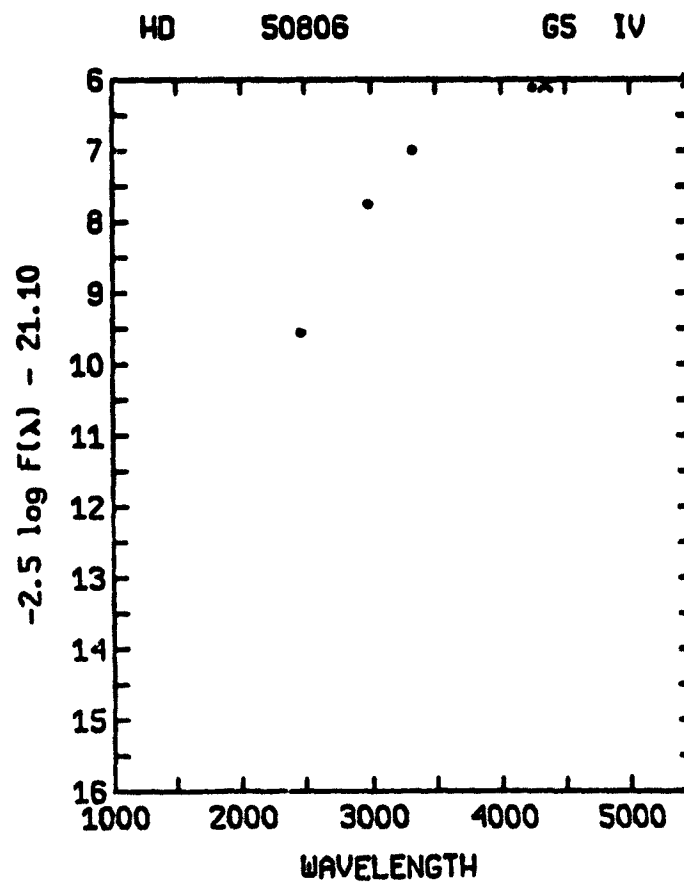
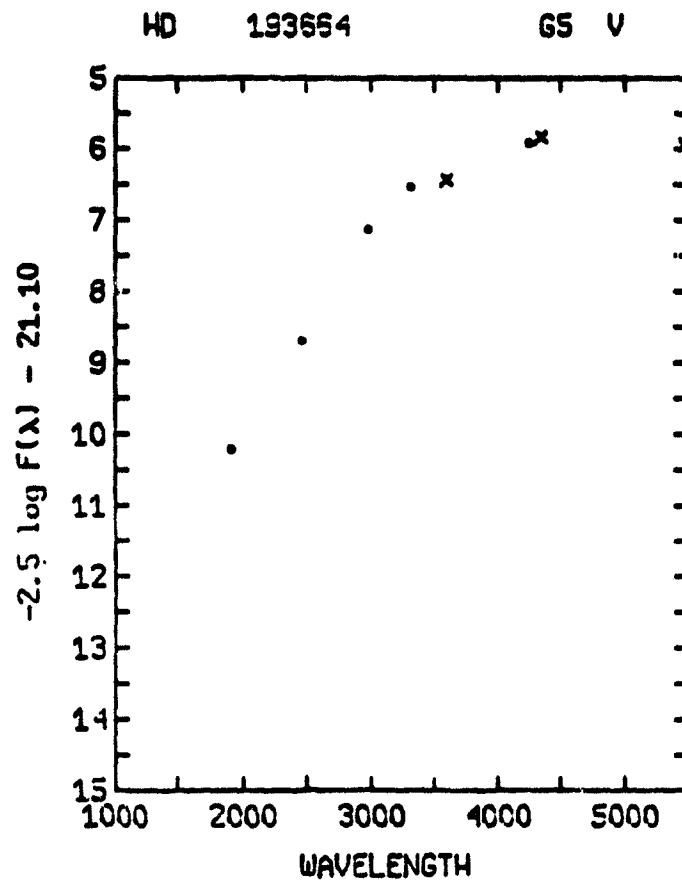


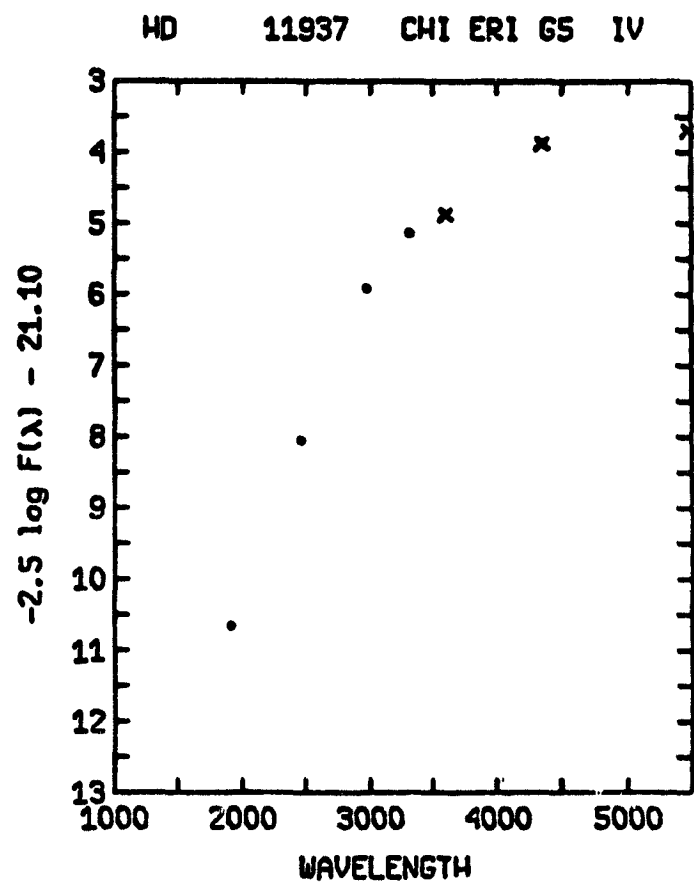
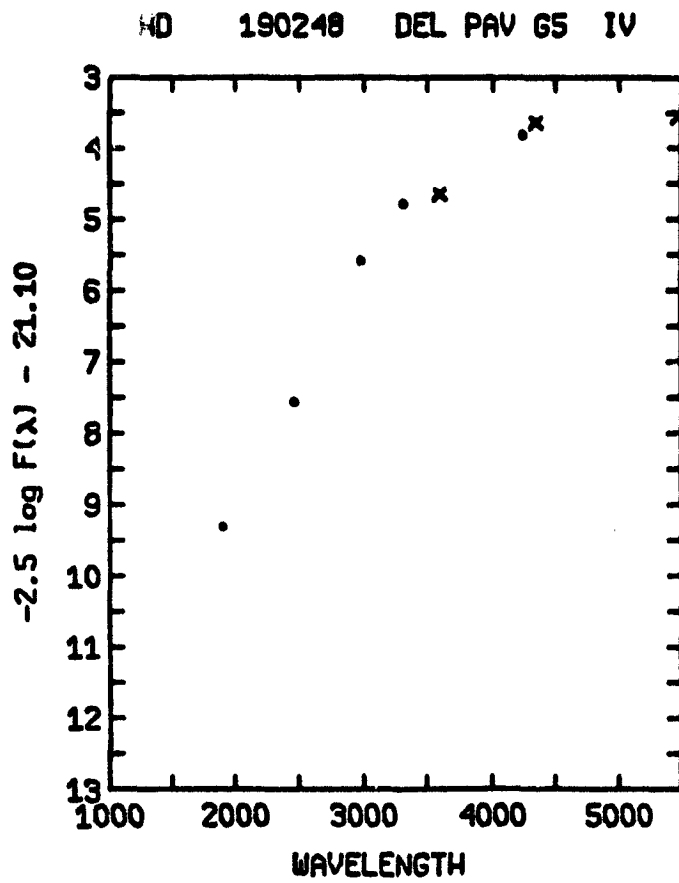
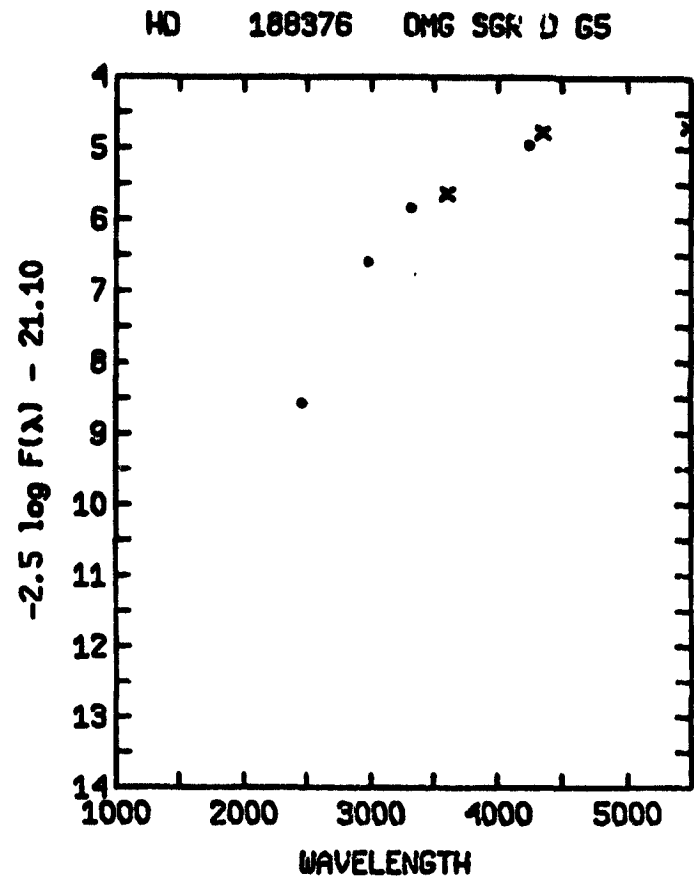
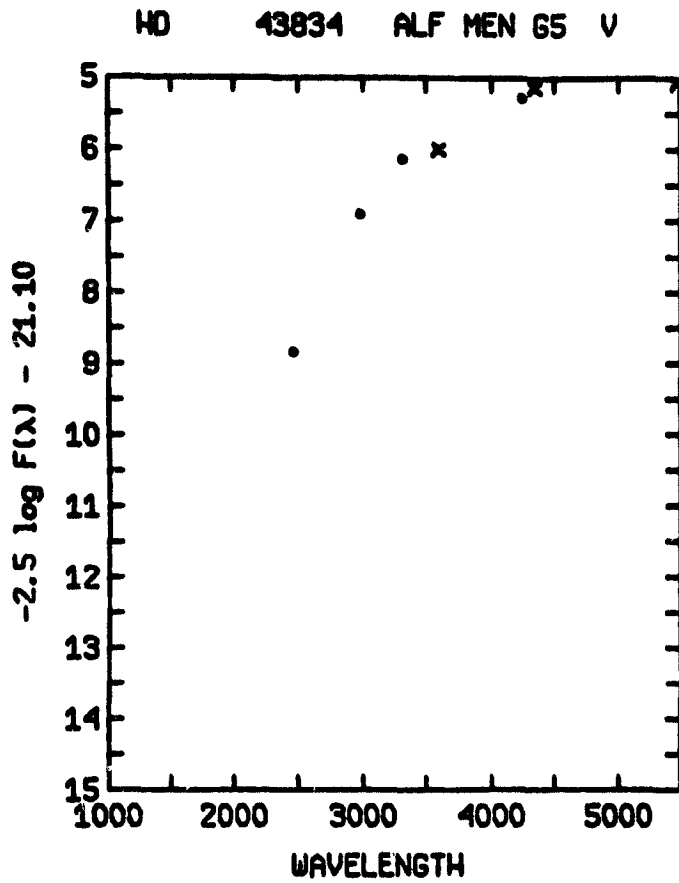
HD 78418 75 CNC D G3



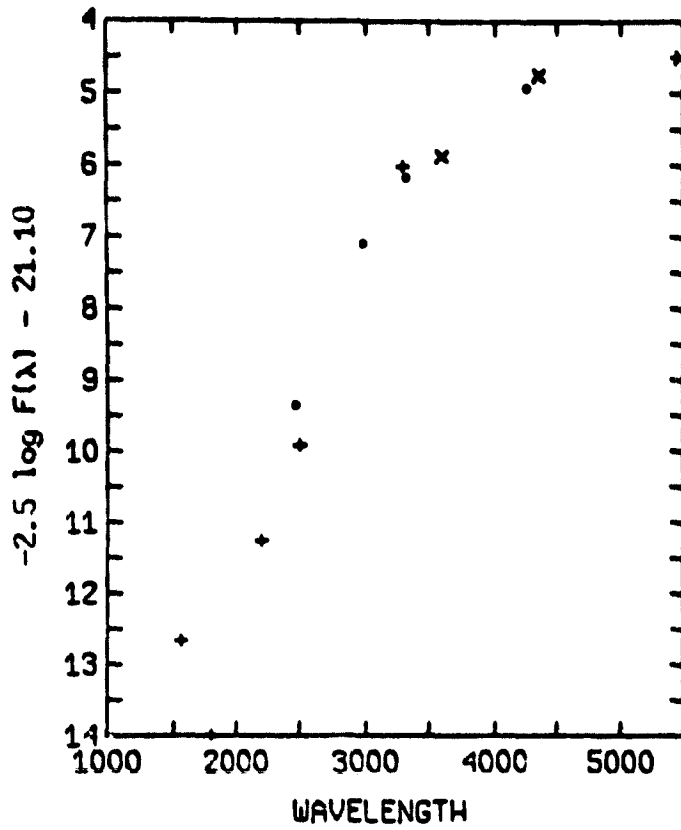


G5 stars
001-002

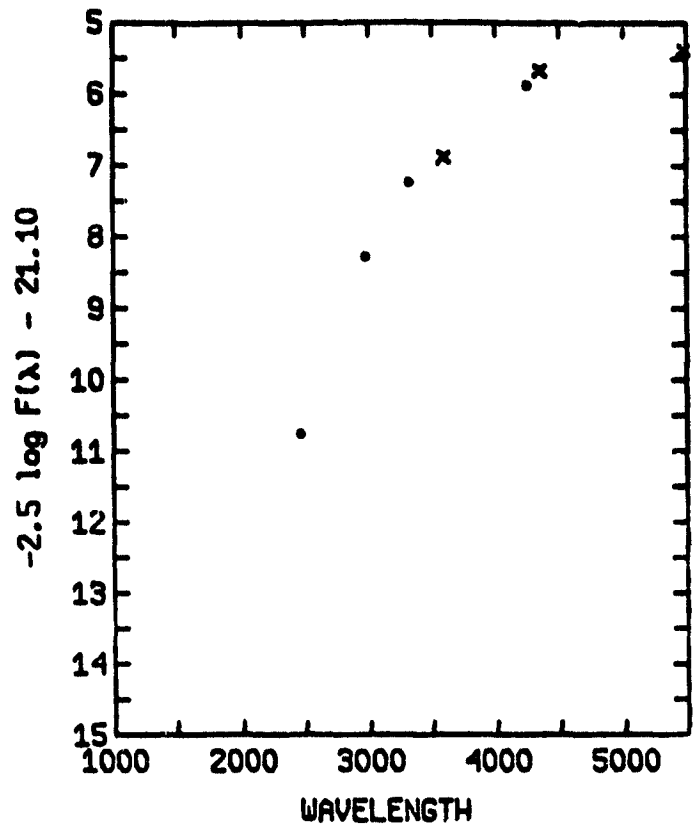




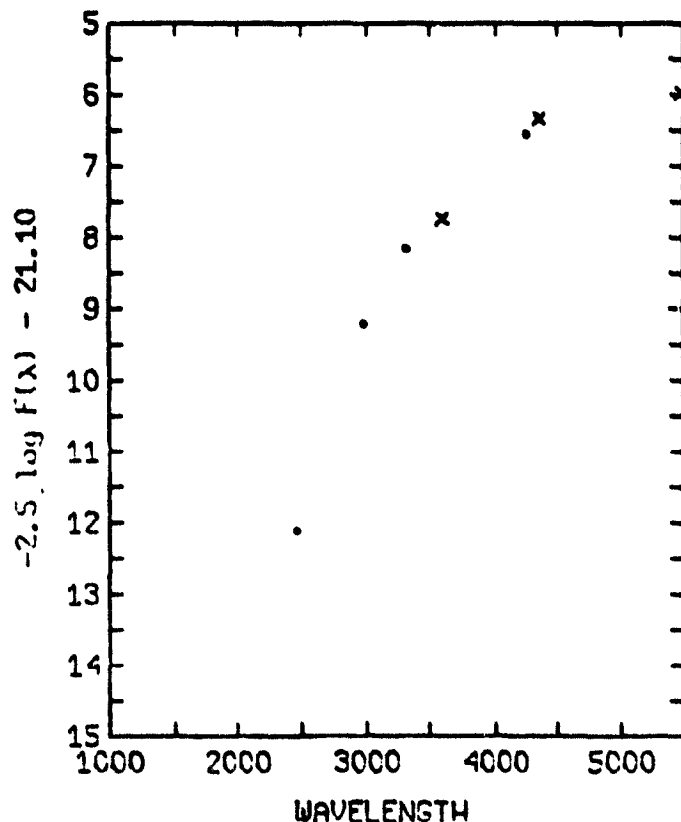
HD 204381 36 CAP G G5



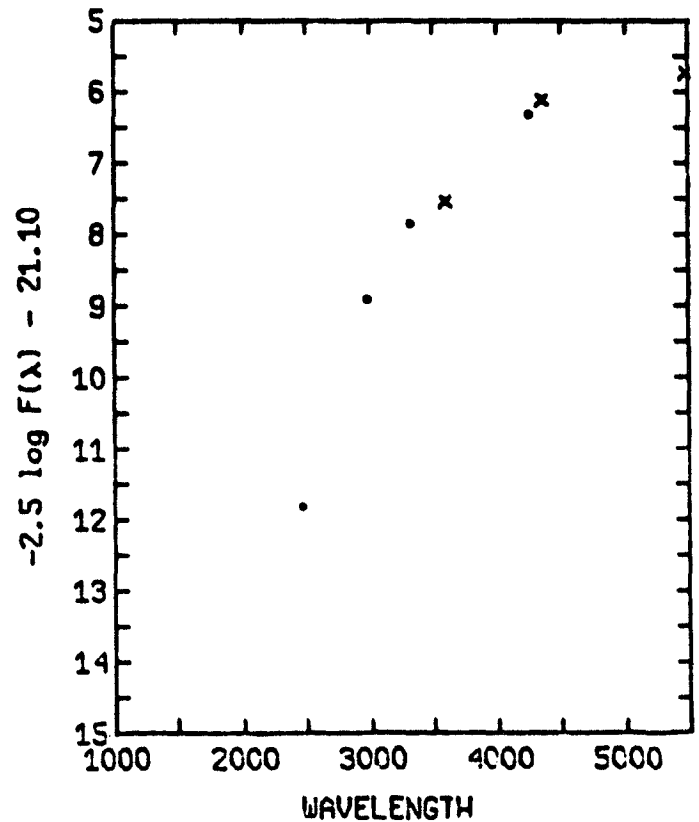
HD 46116 P12 DOR G5



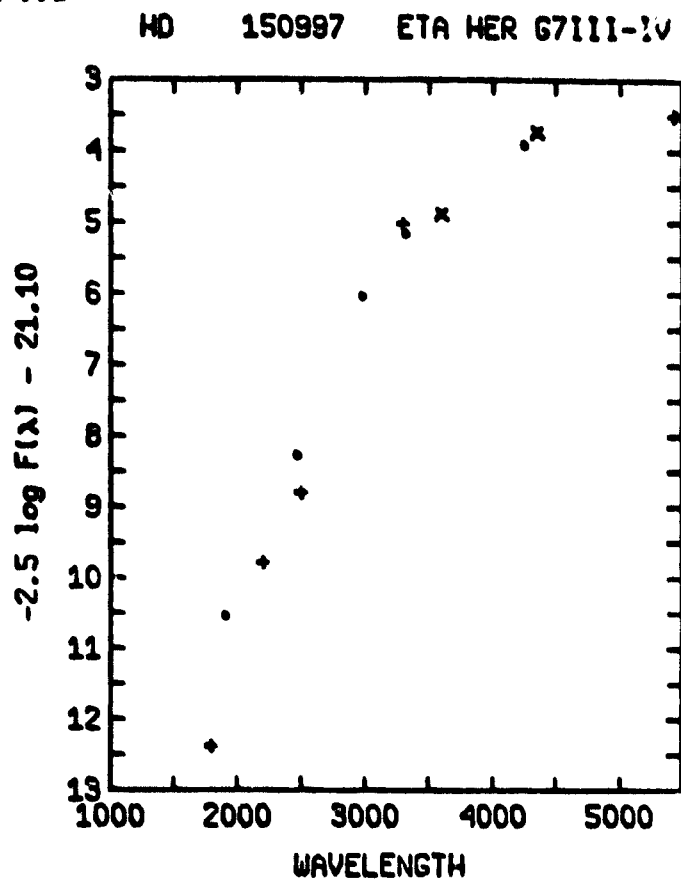
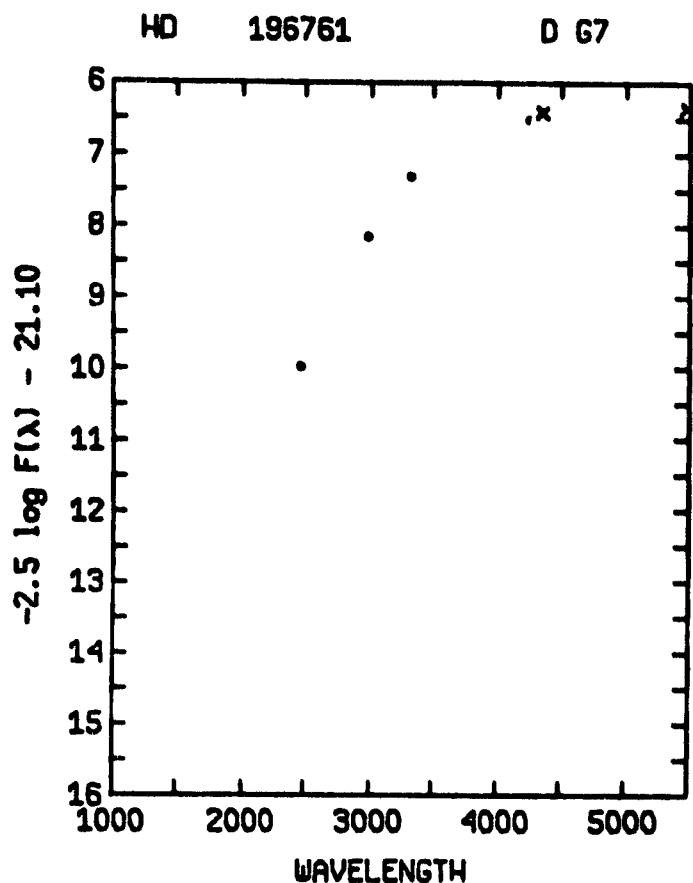
HD 21565 G5



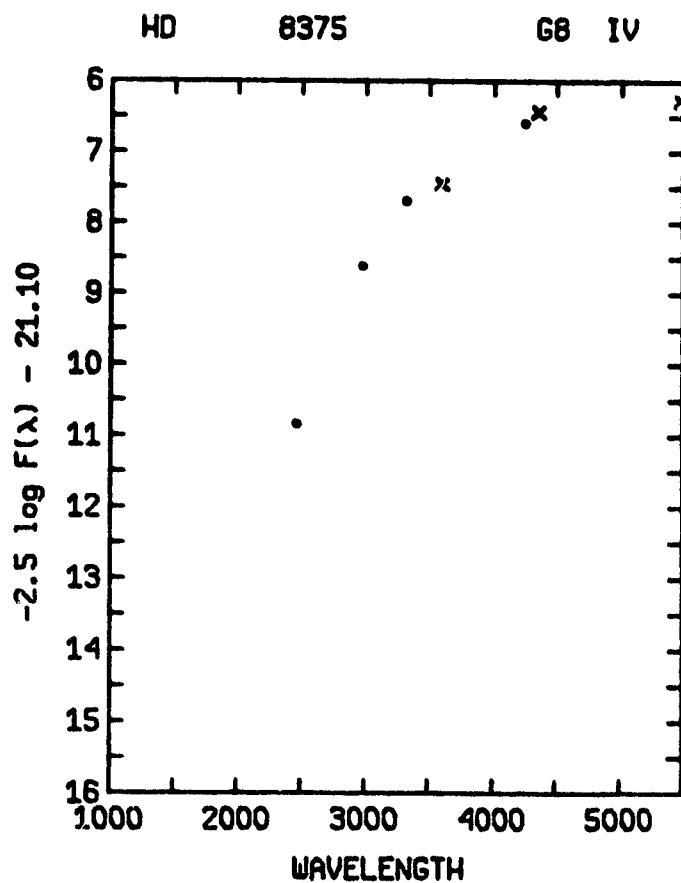
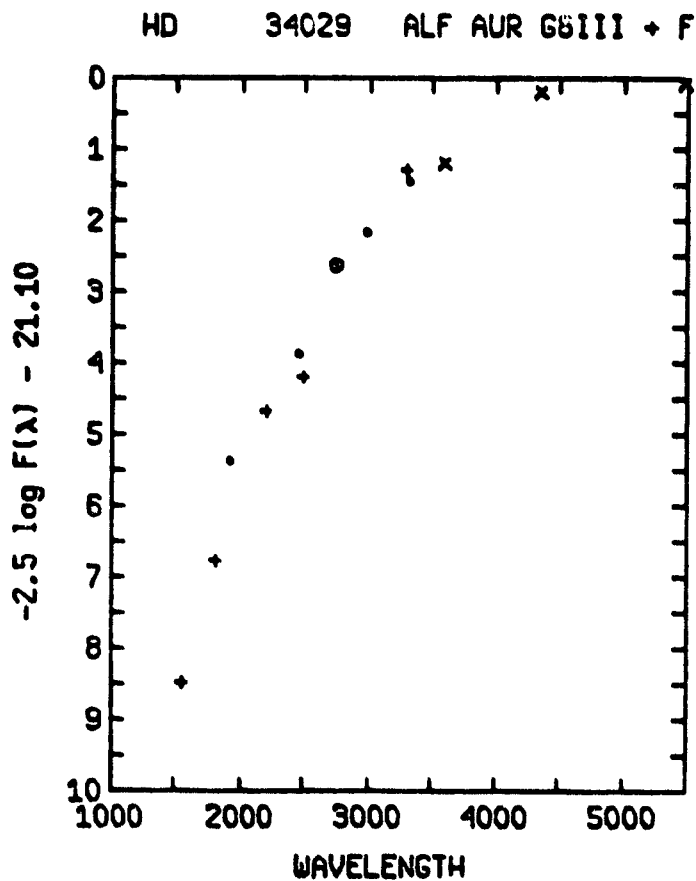
HD 18784 RHO1ER1 G5



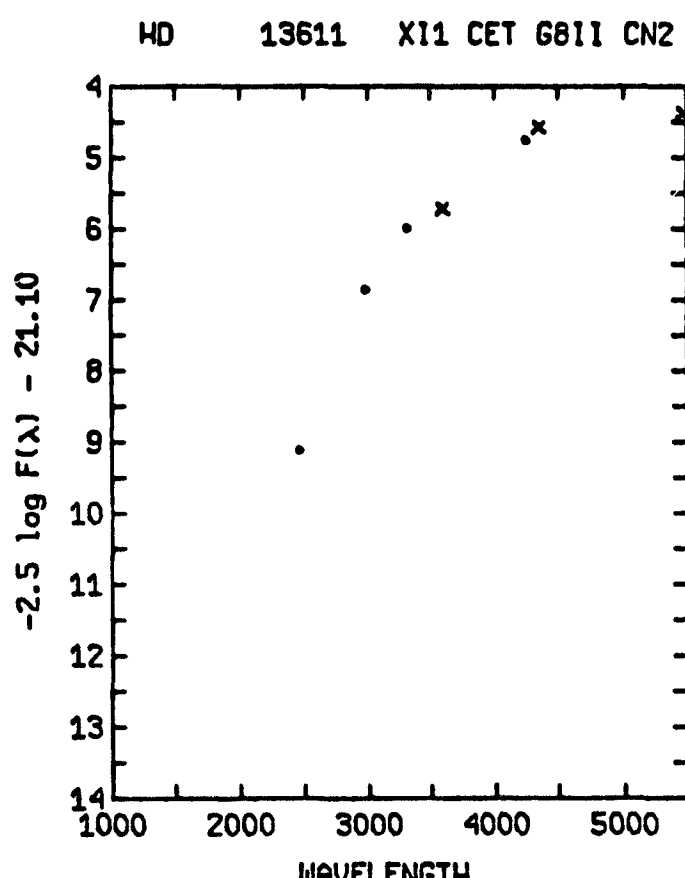
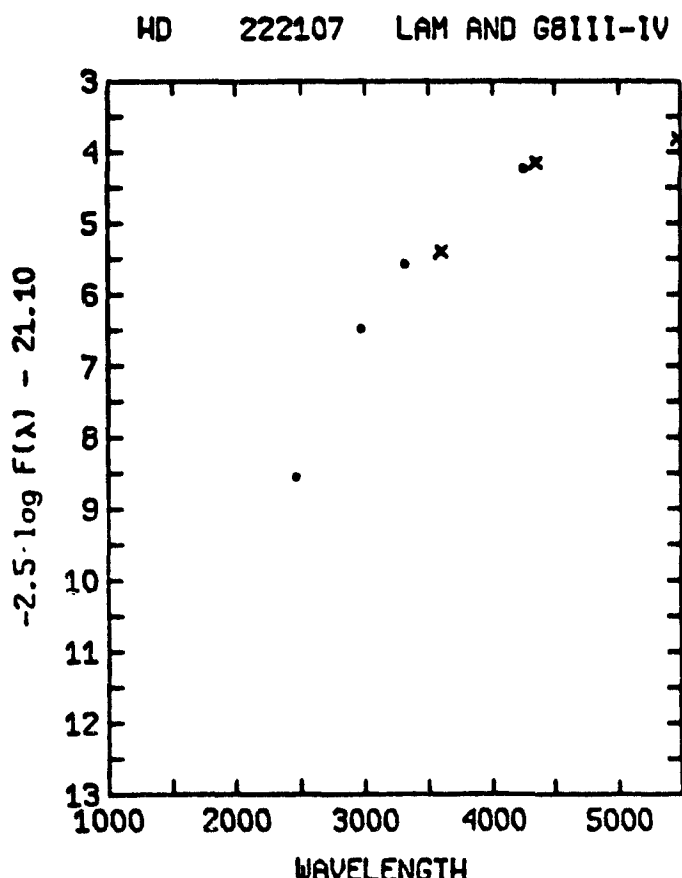
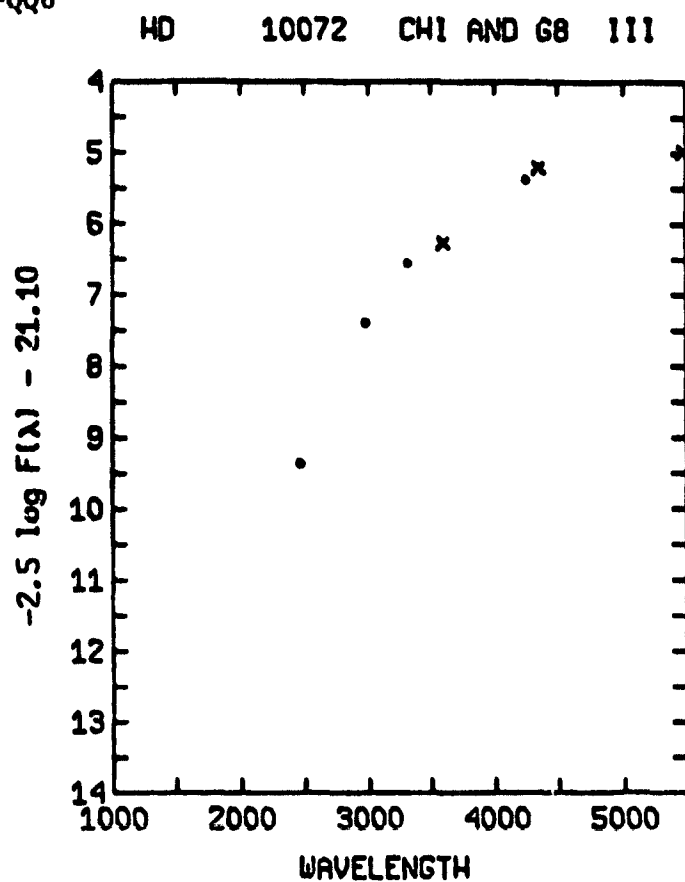
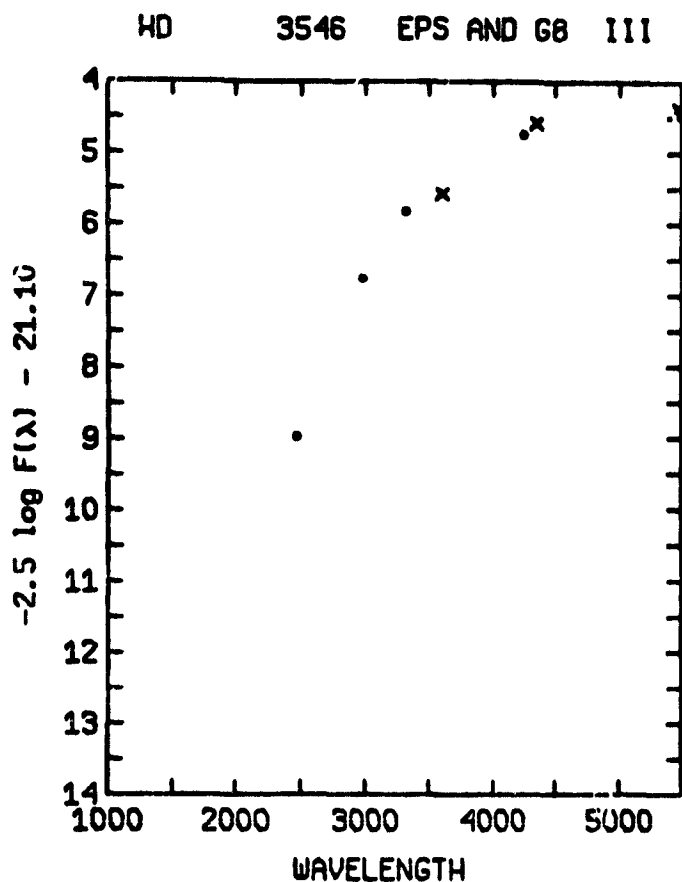
G7 stars
PP1-PP2



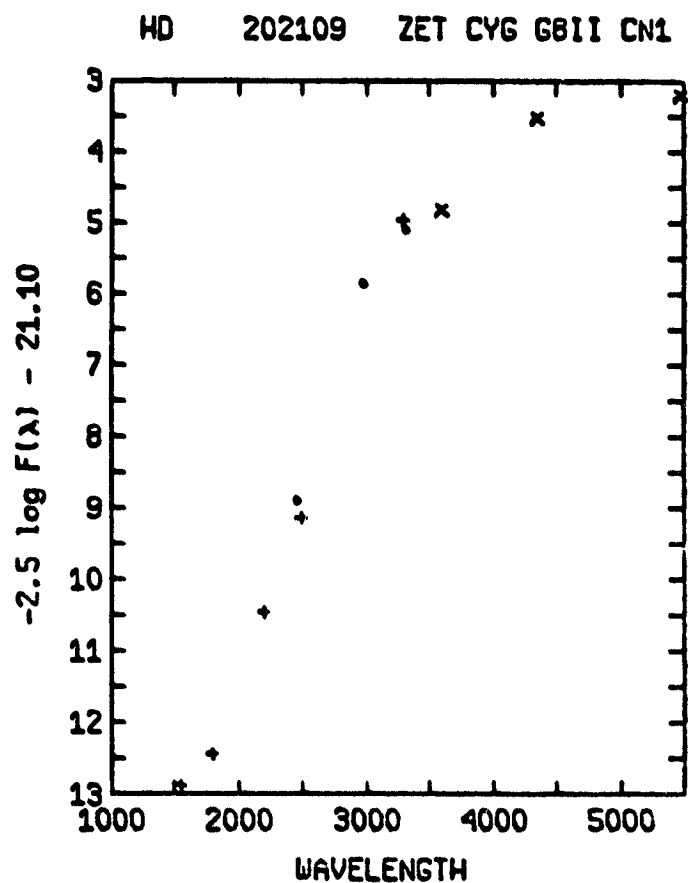
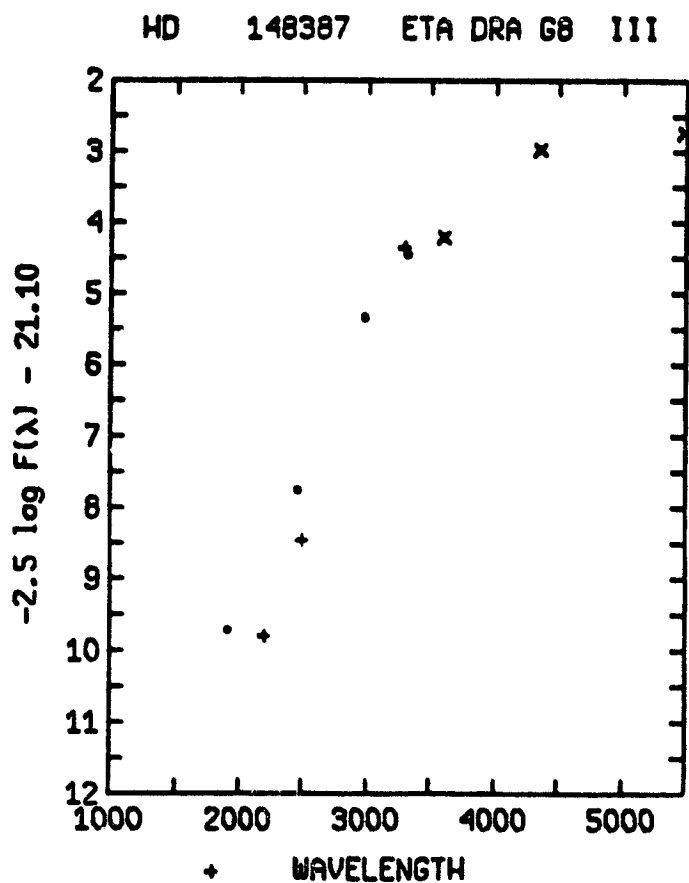
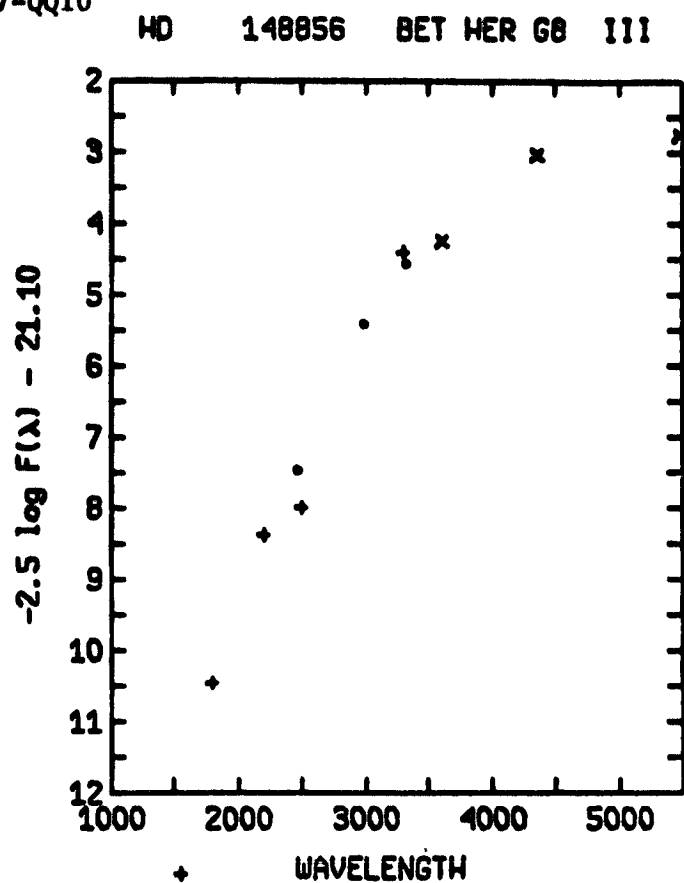
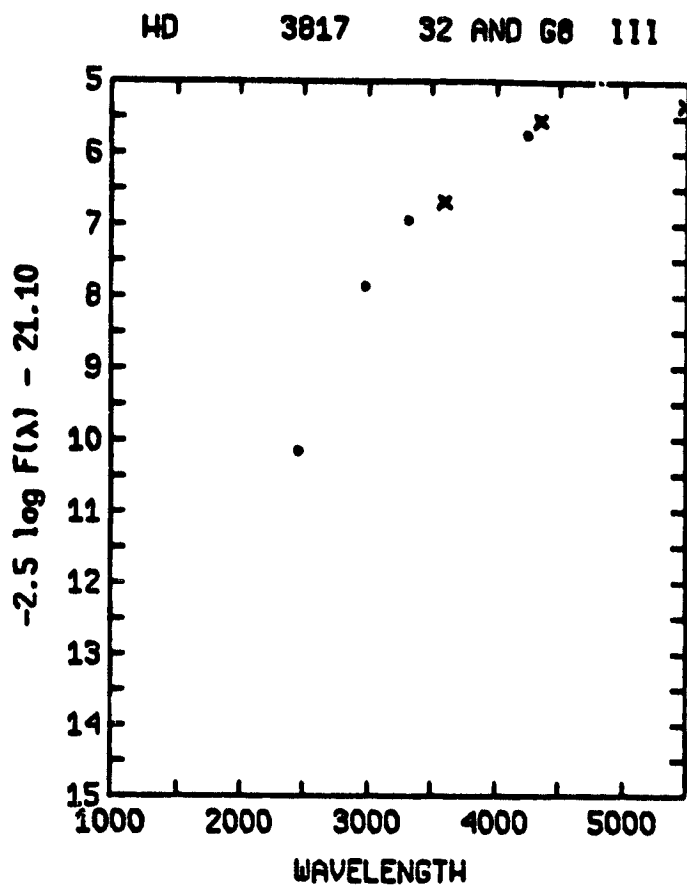
G8-9 stars
QQ1-QQ2



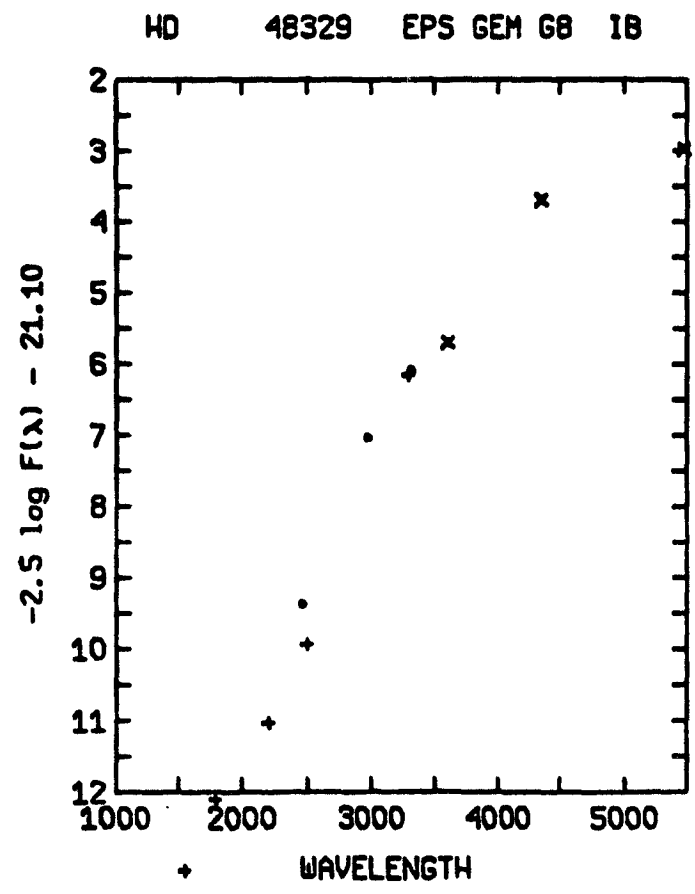
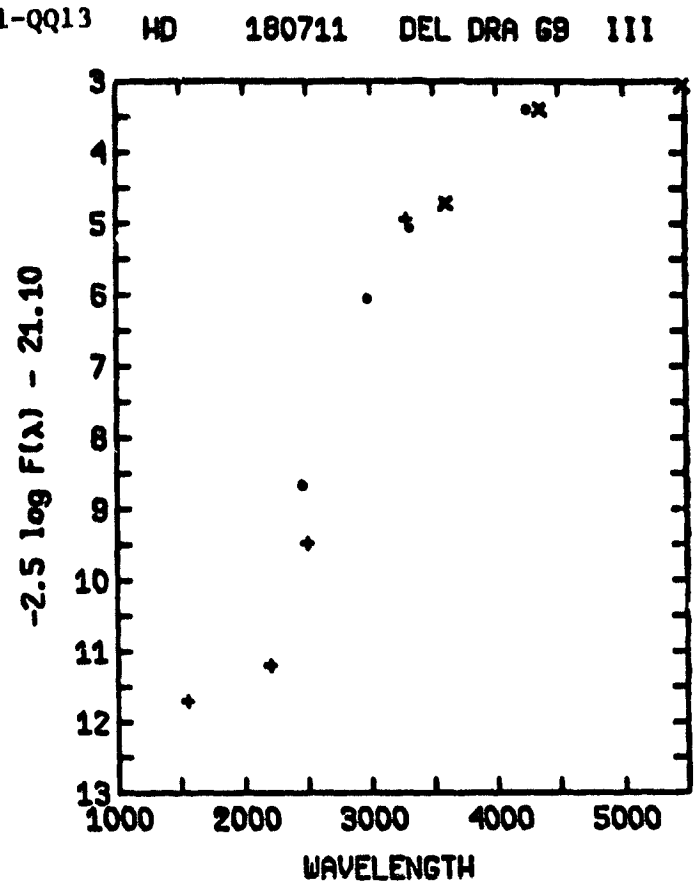
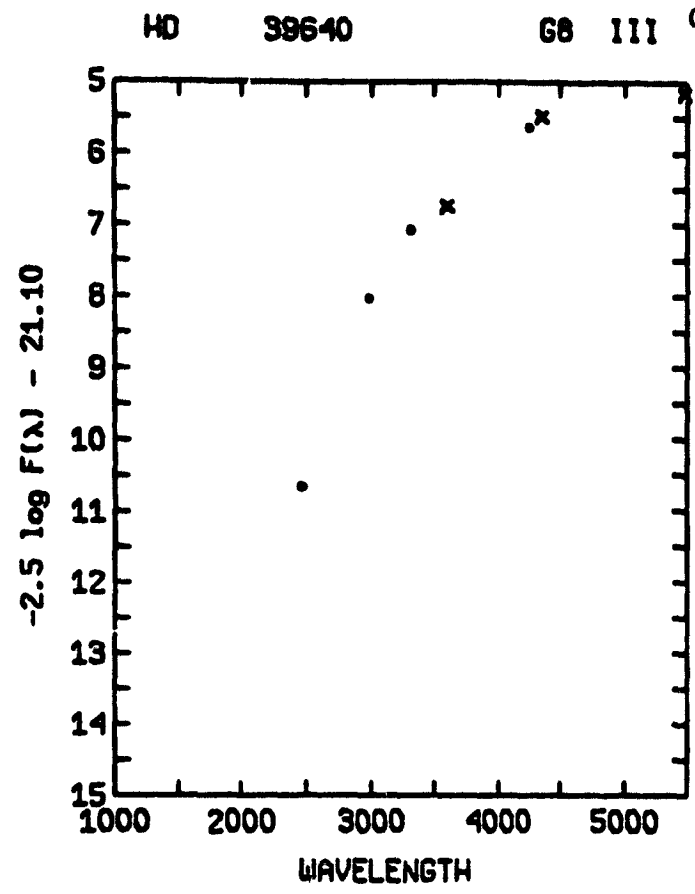
G8-9 stars
QQ3-QQ6



G8-9 stars
QQ7-QQ10

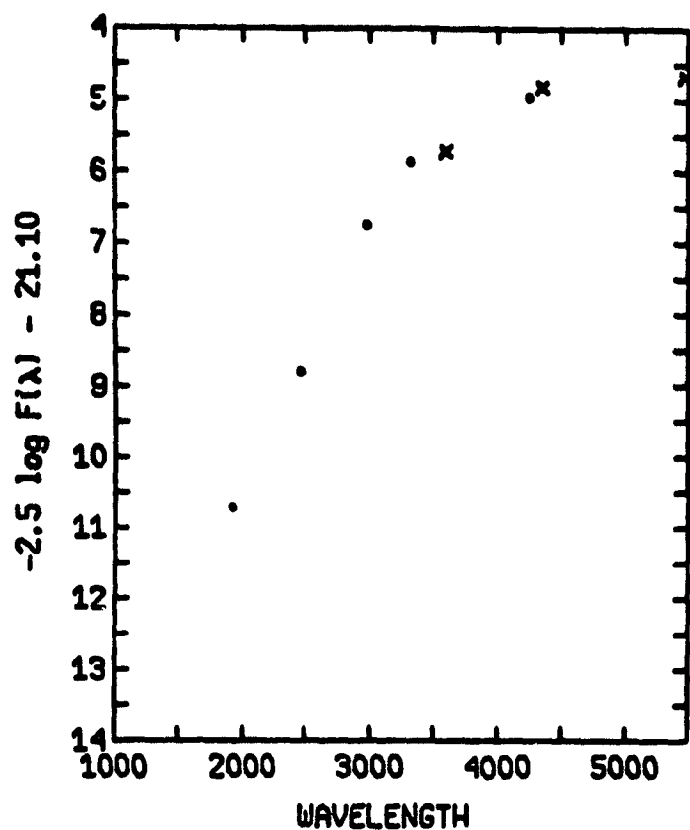


G8-9 stars
QQ11-QQ13

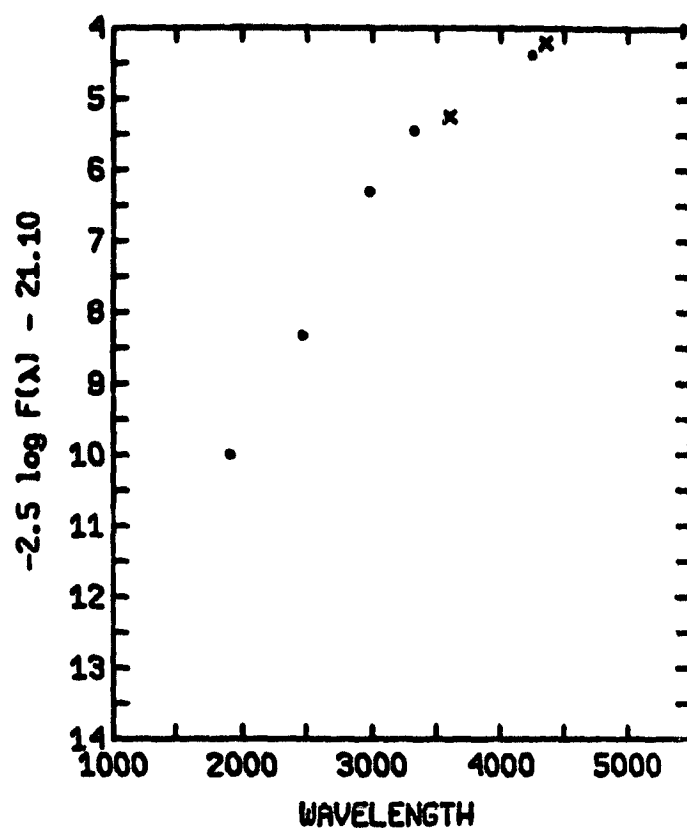


KO stars
RR1-RR4

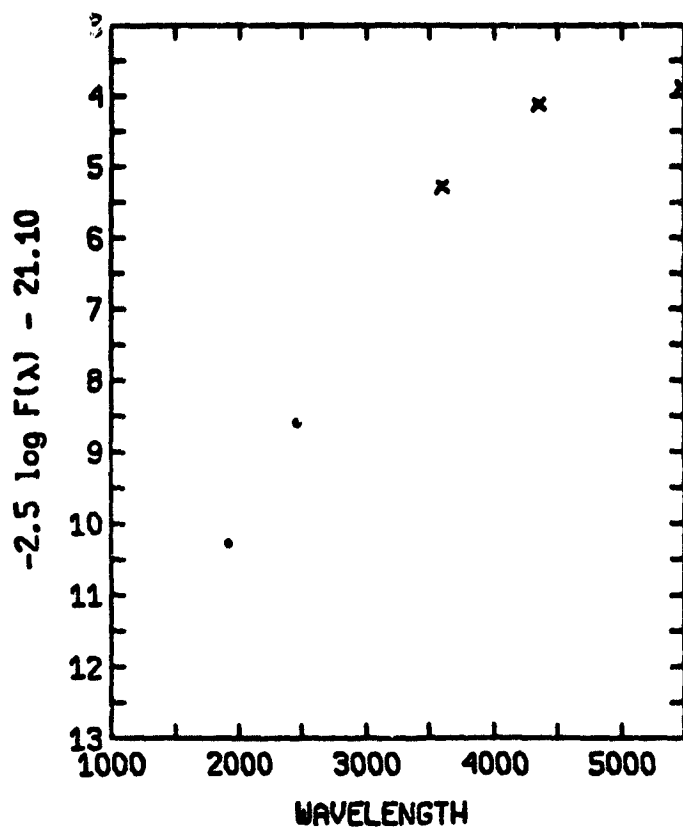
HD 185144 SIG DRA KO V



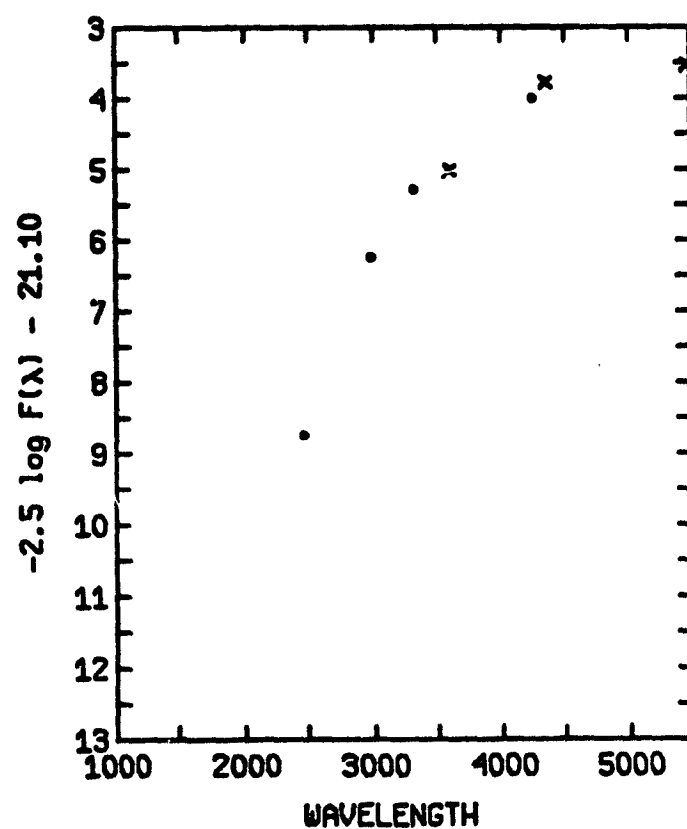
HD 165341 70 OPH KO V

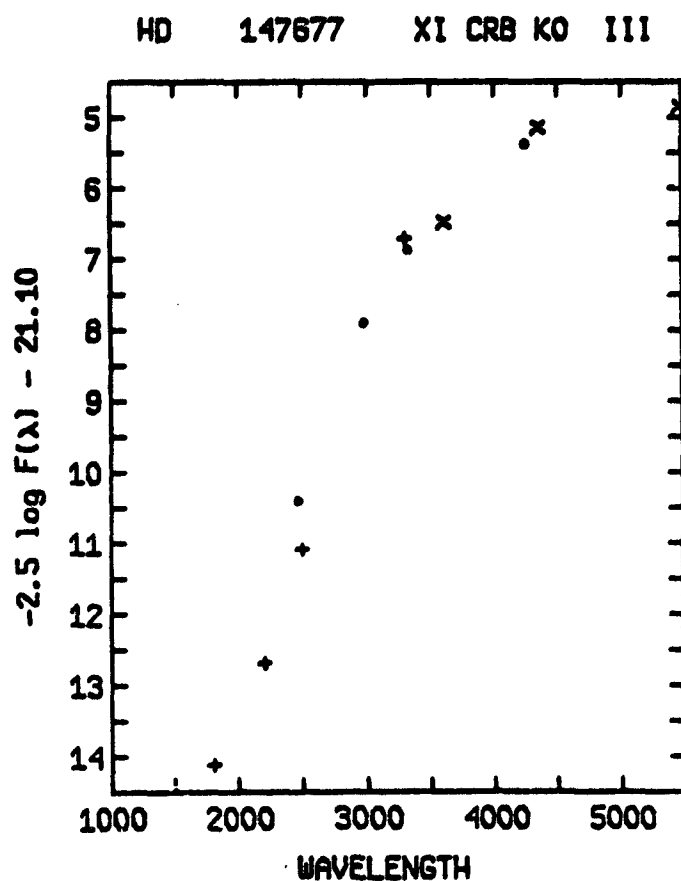
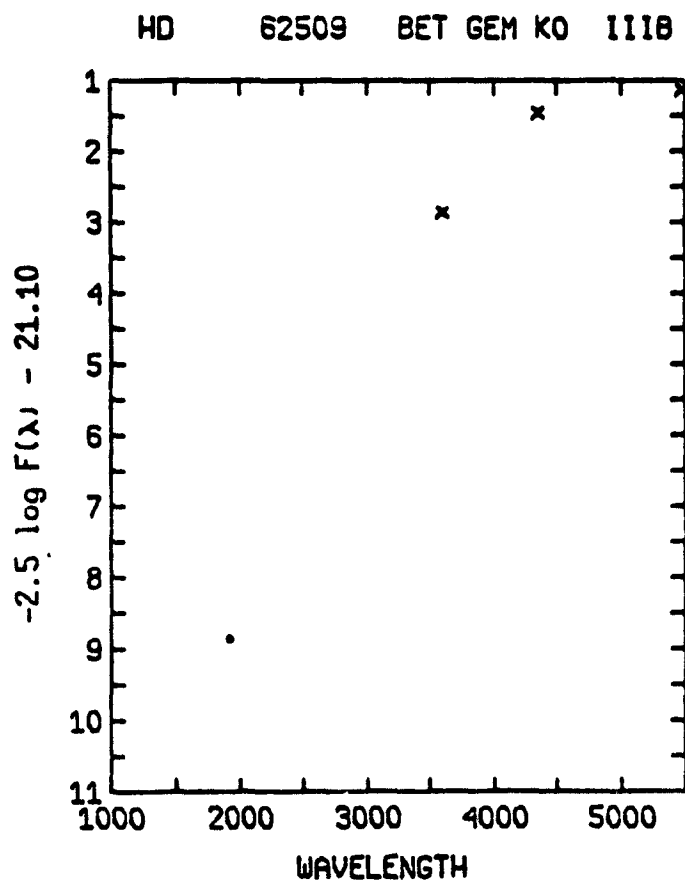
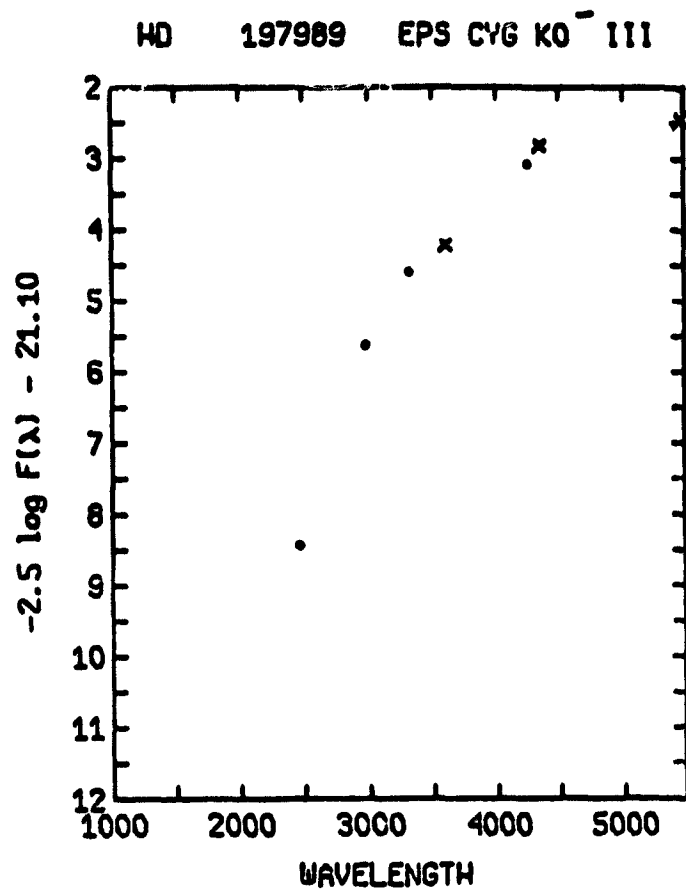
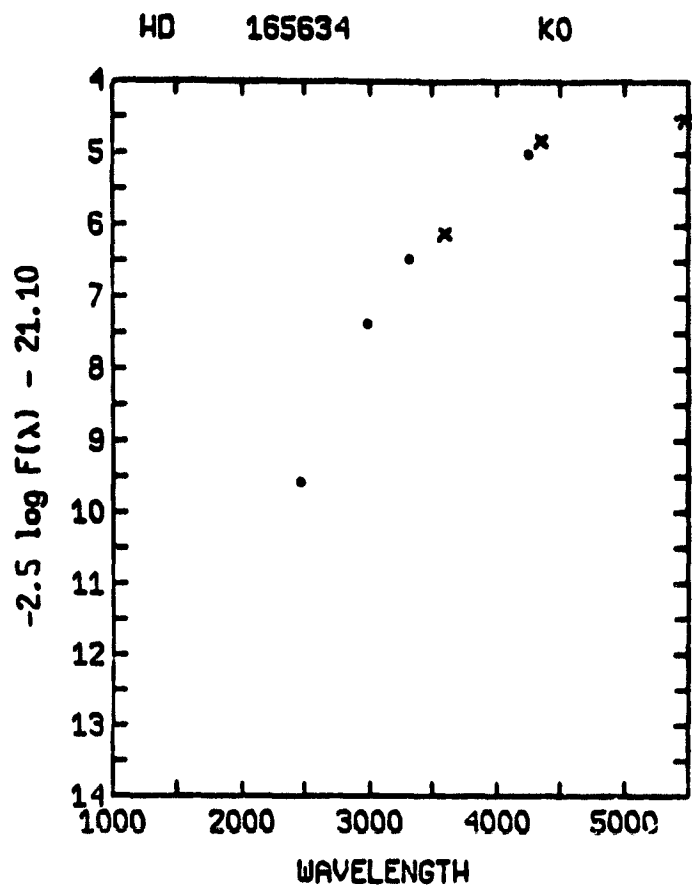


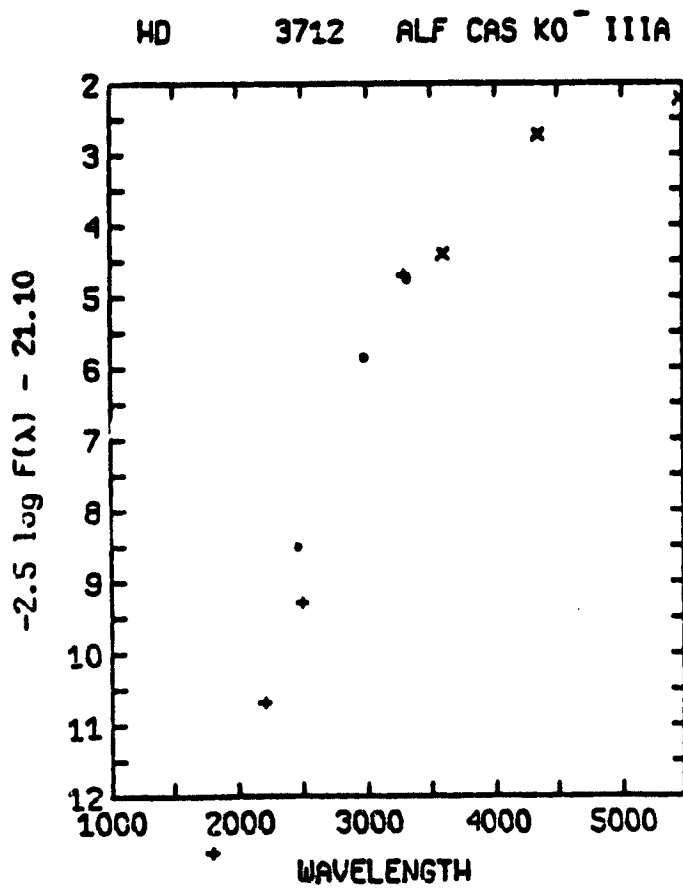
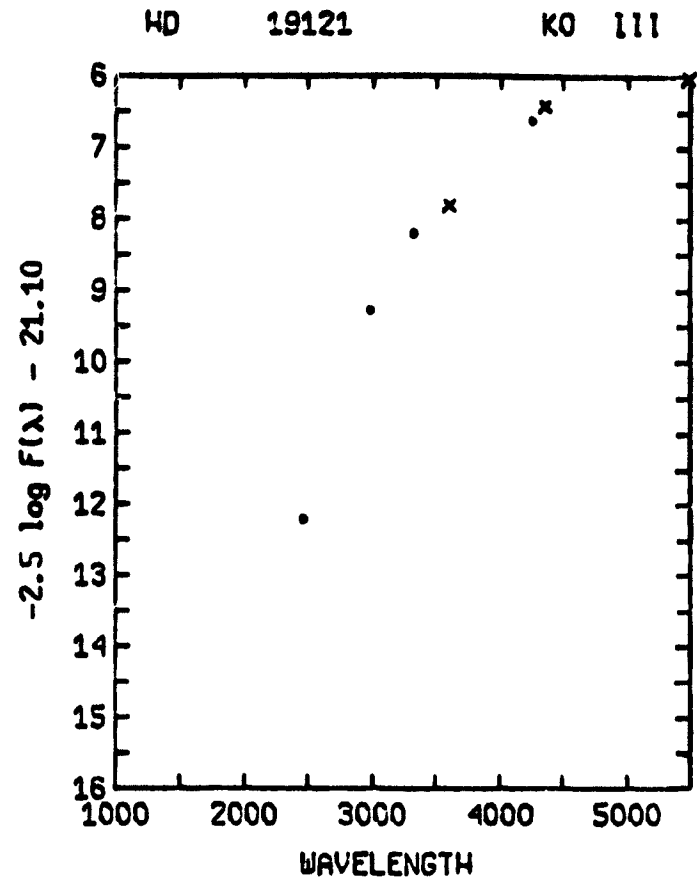
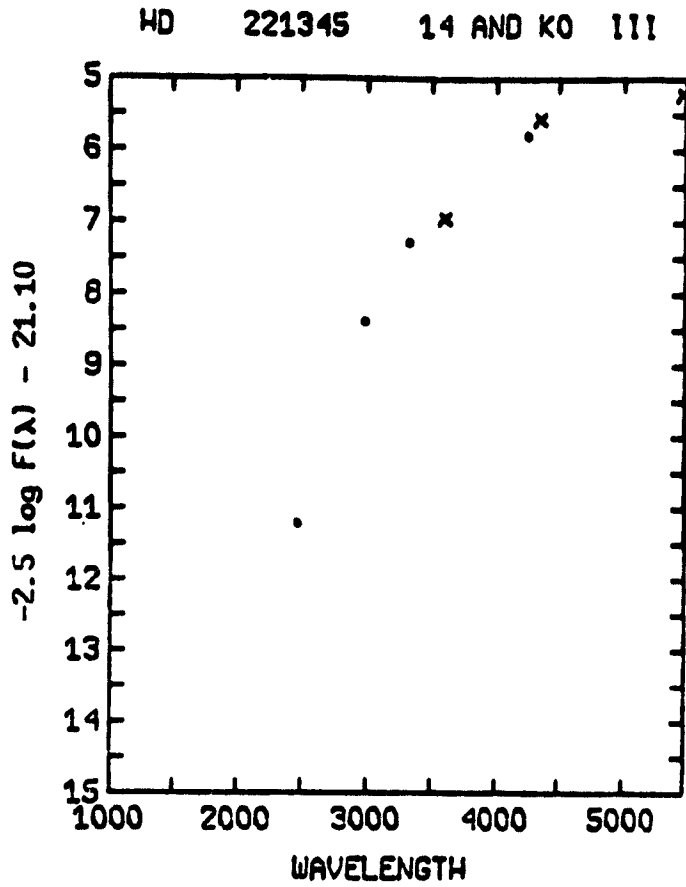
HD 147675 GAM APS KO IV

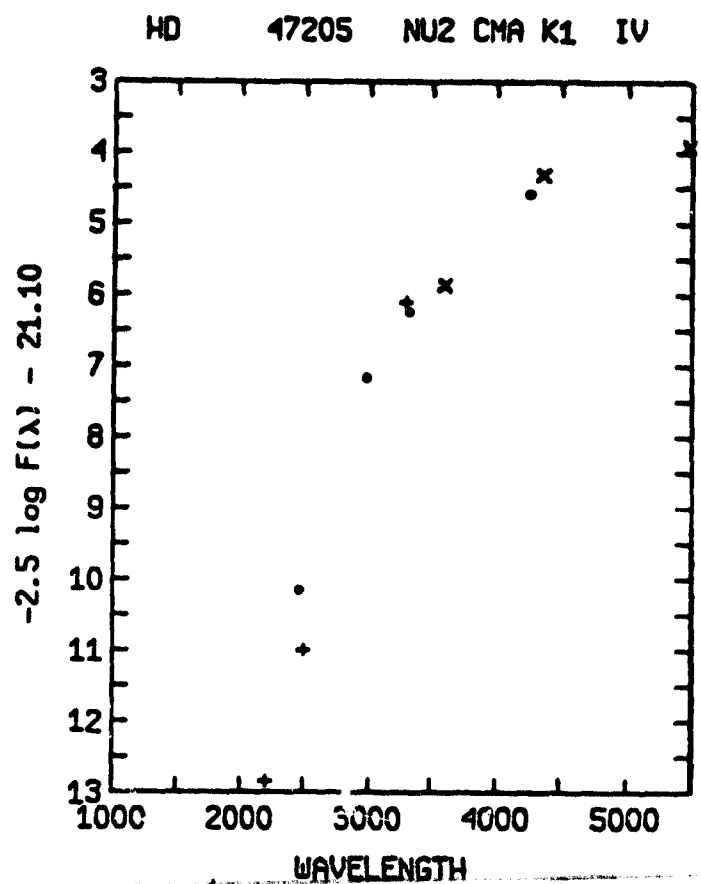
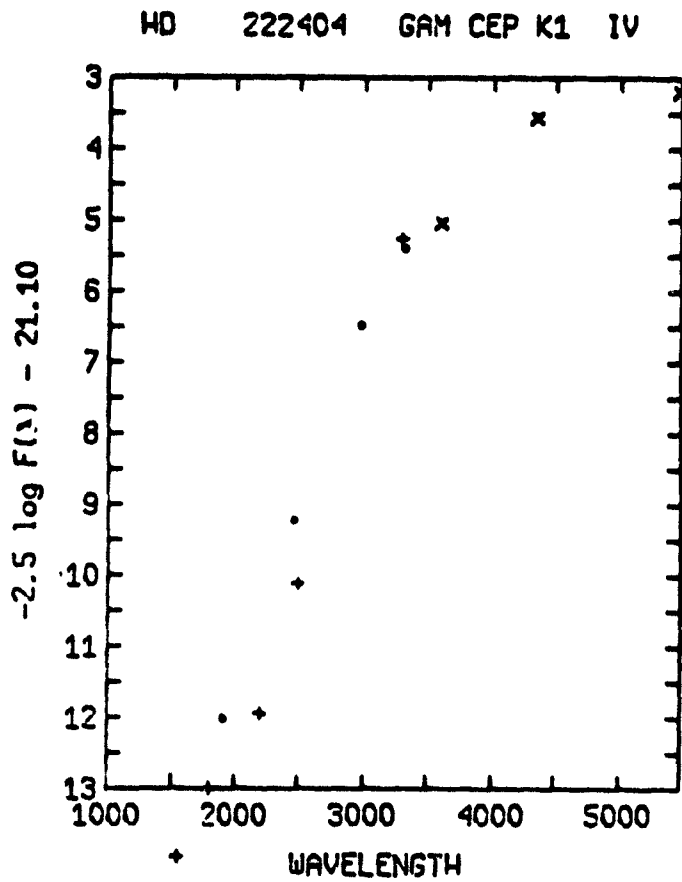
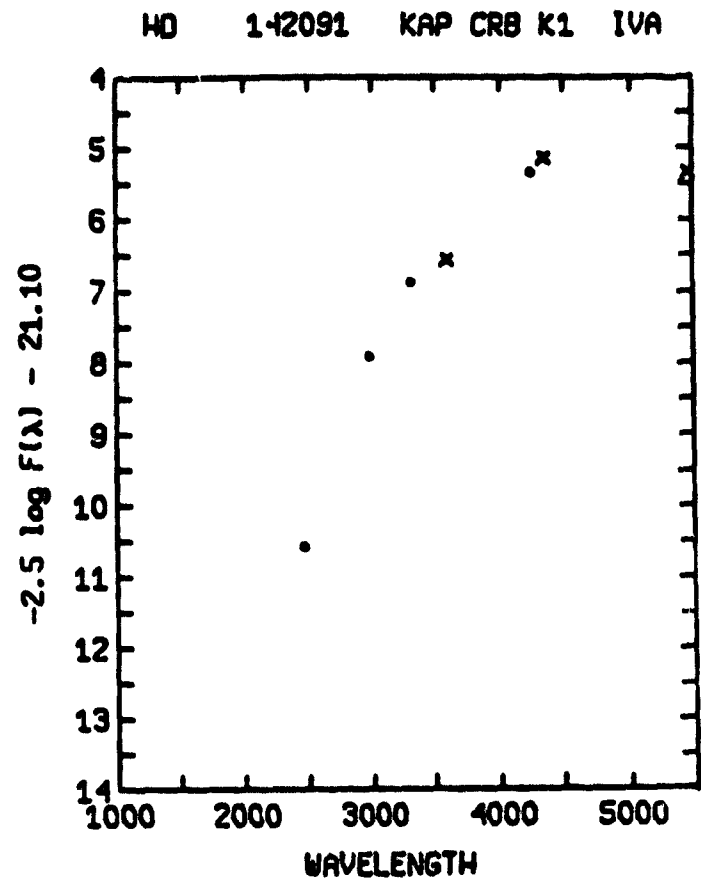
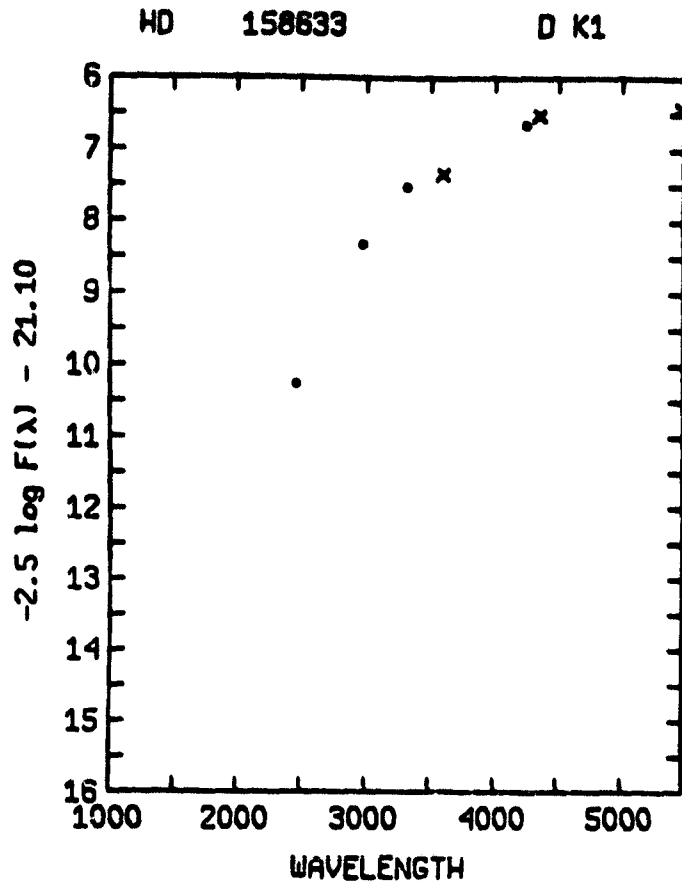


HD 23249 DEL ERI KO IV

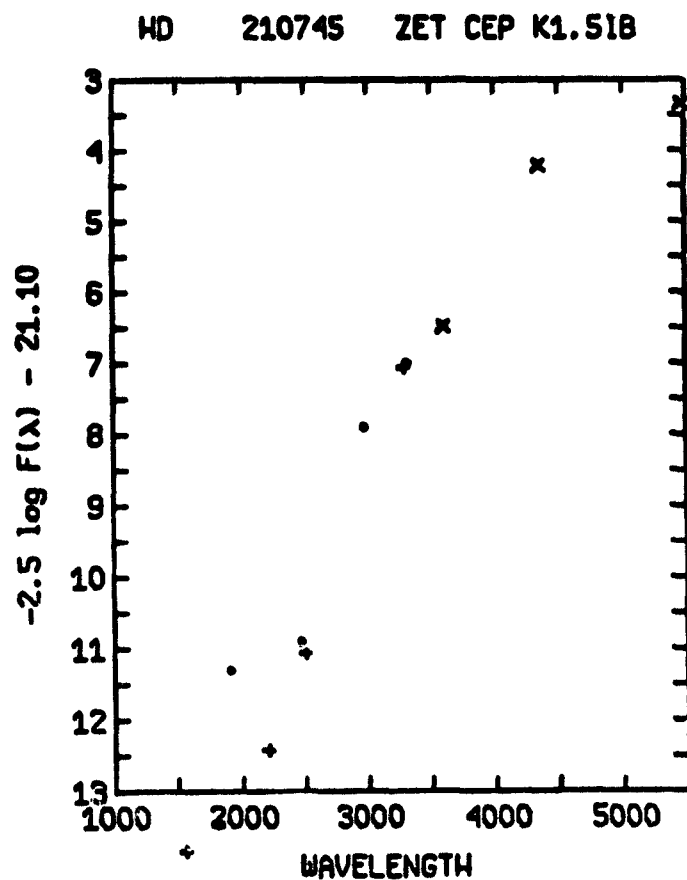
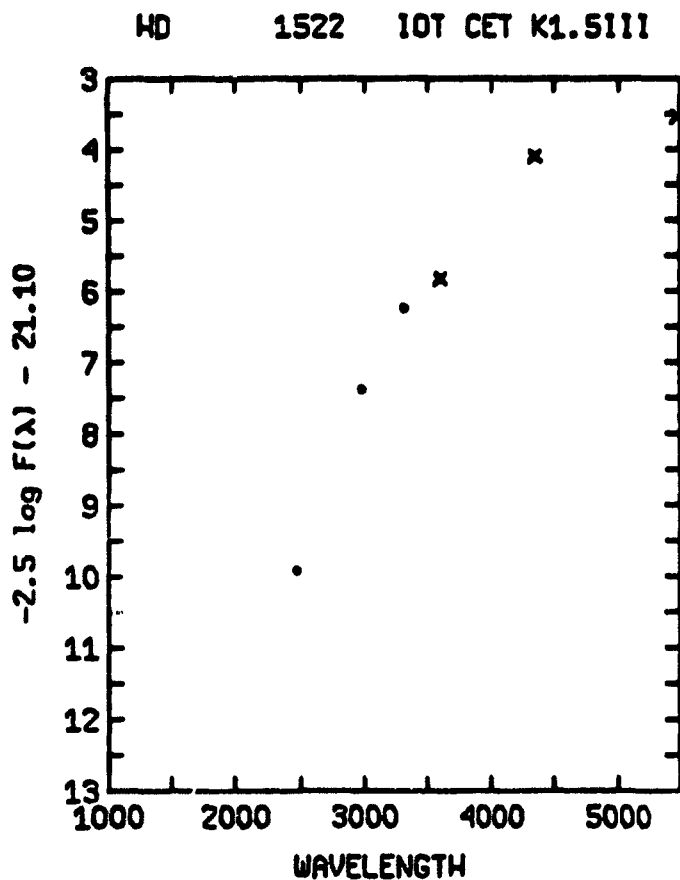
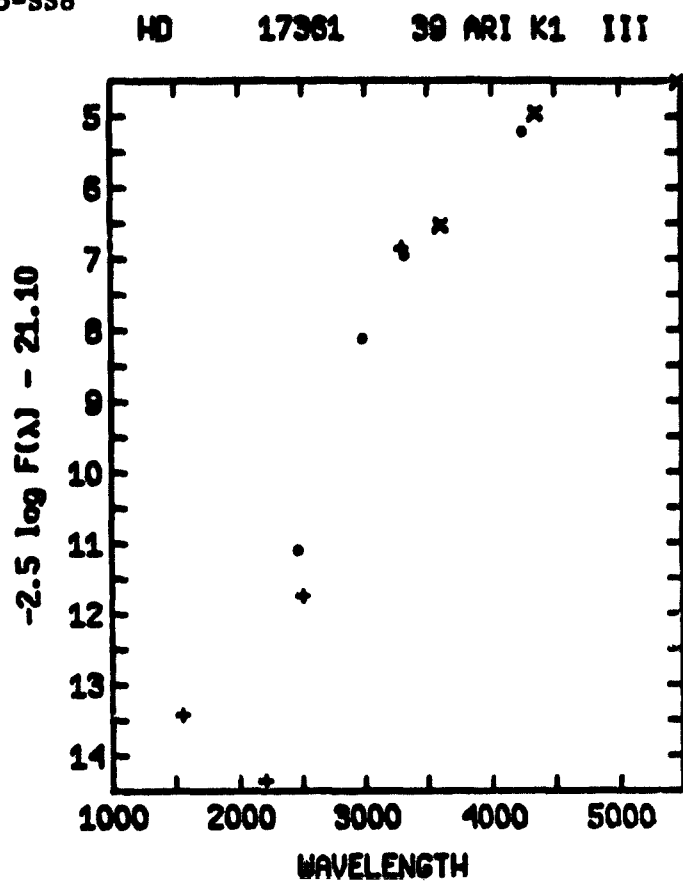
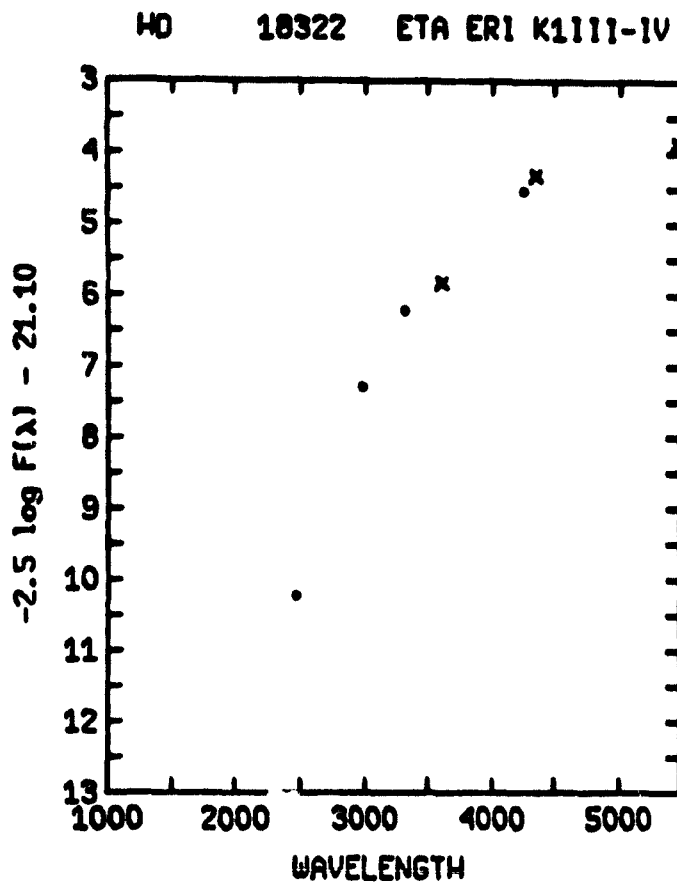


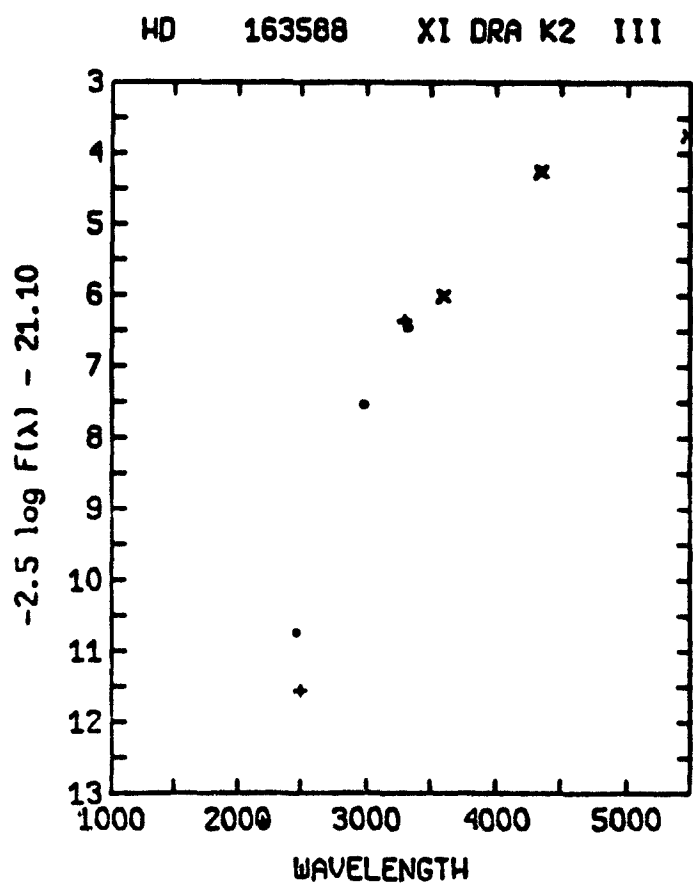
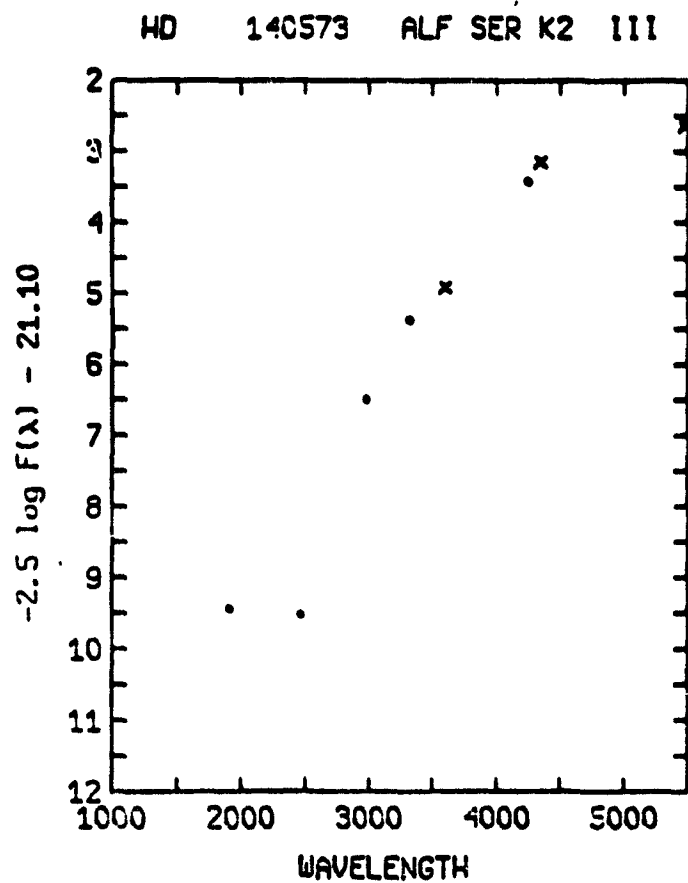
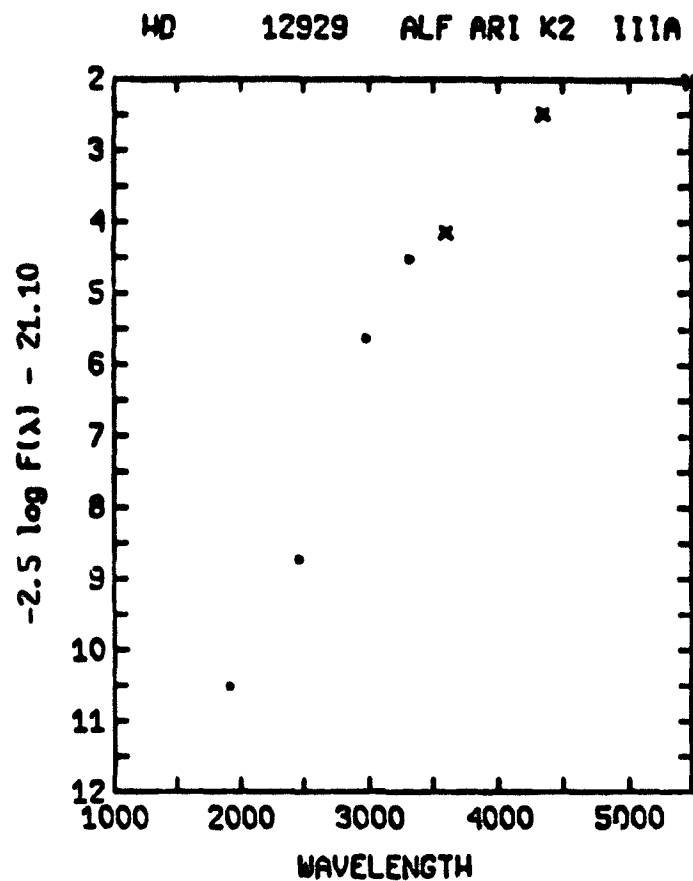
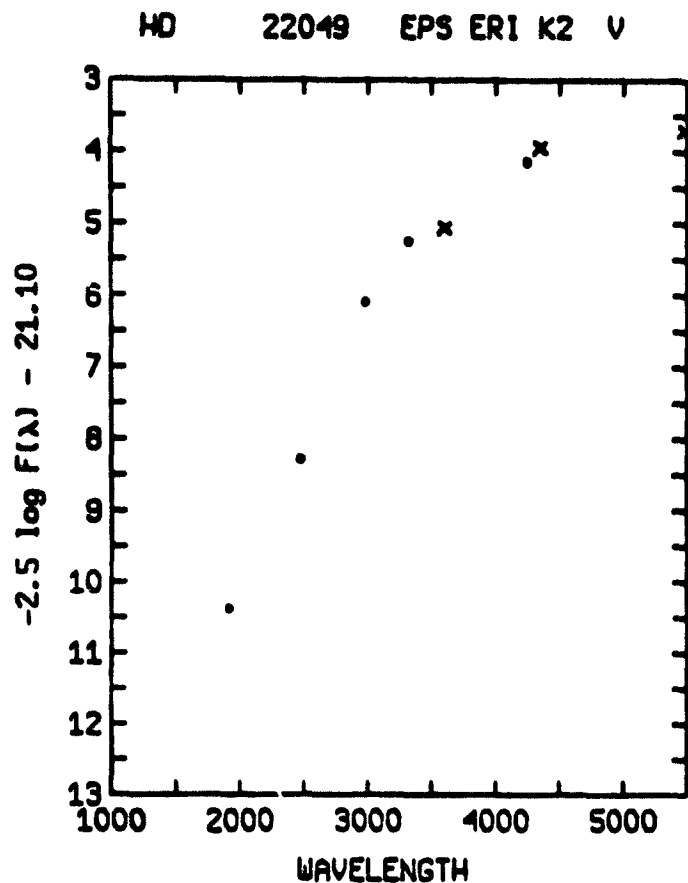






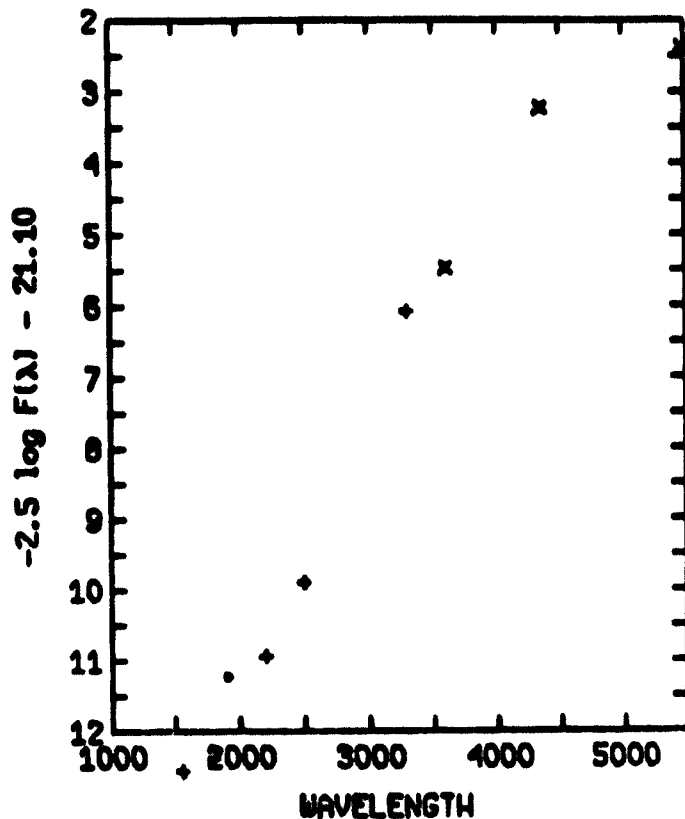
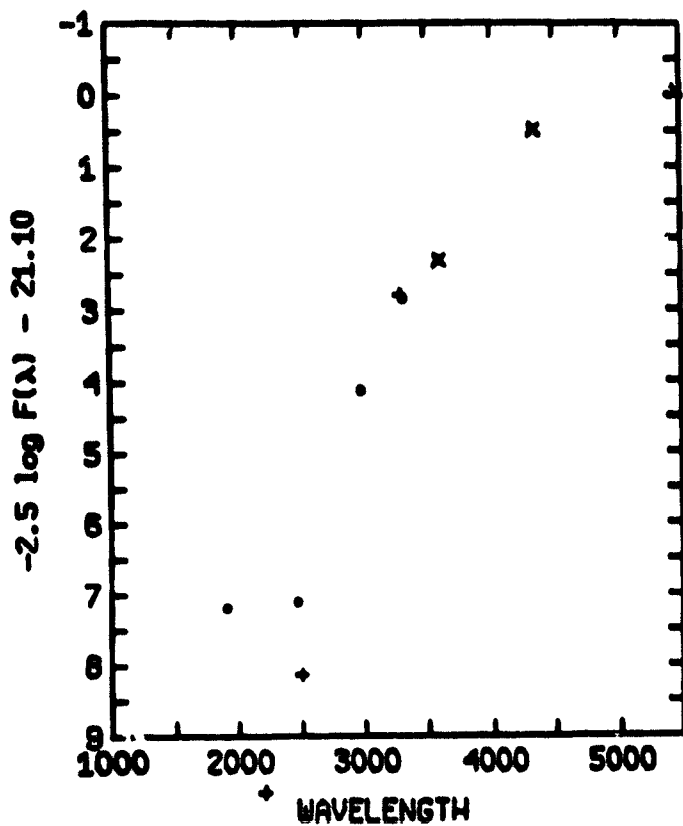
K1-1.5 stars
SS5-SS8



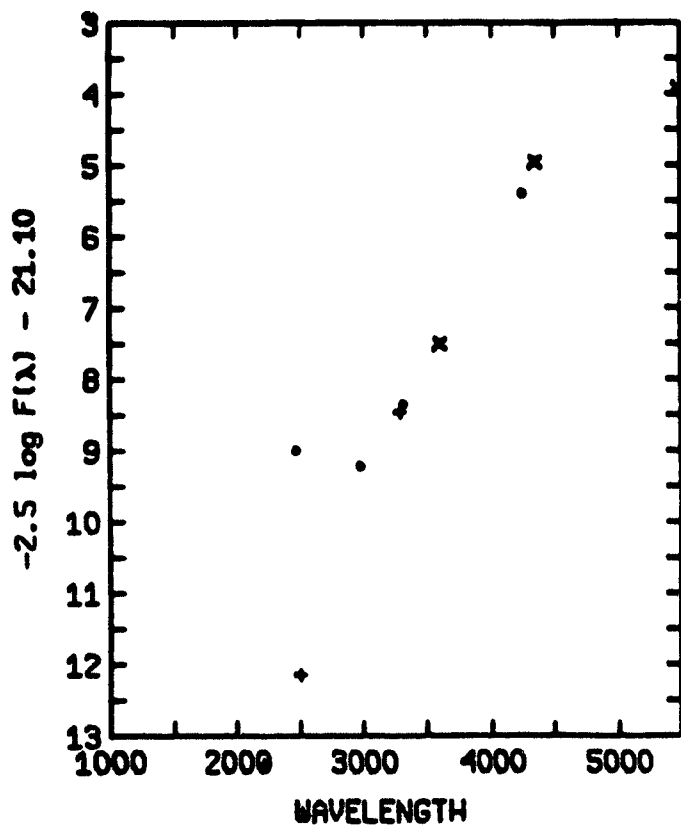


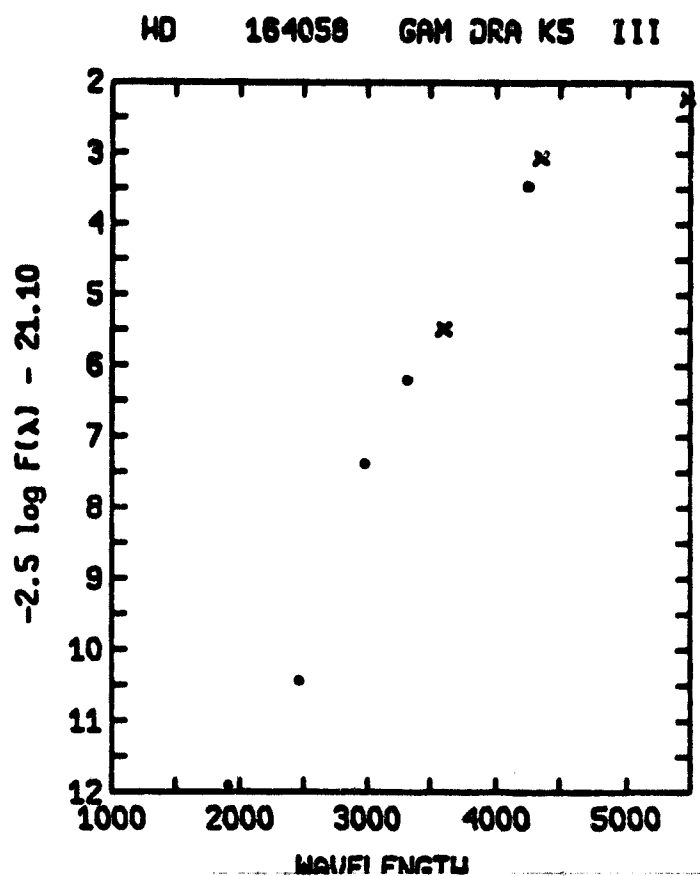
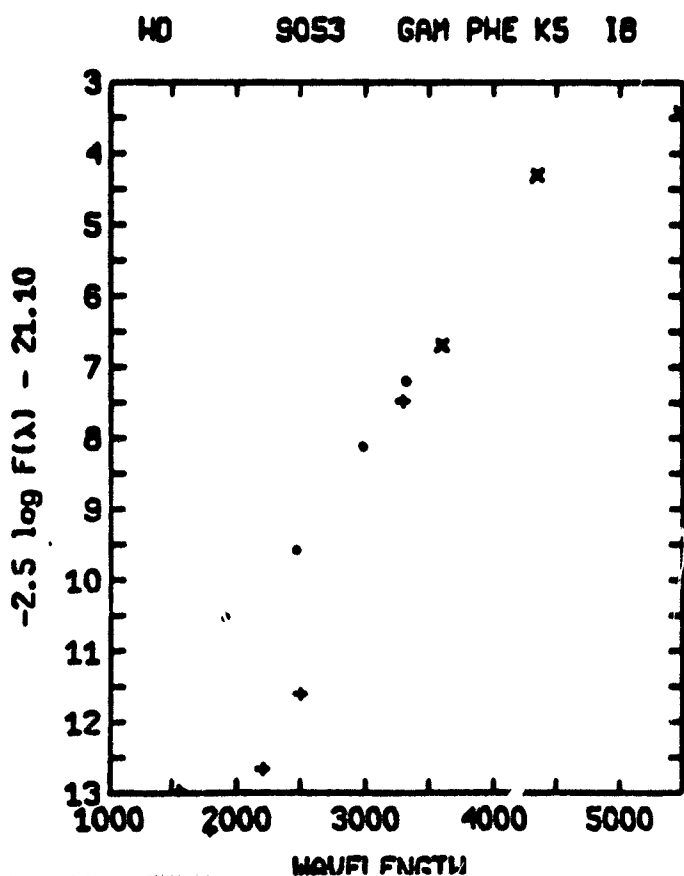
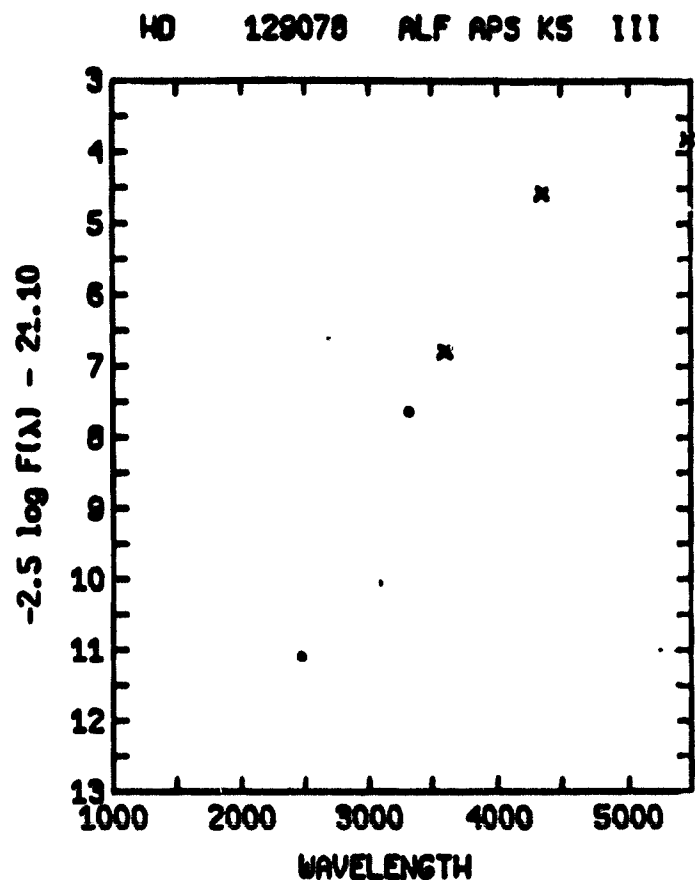
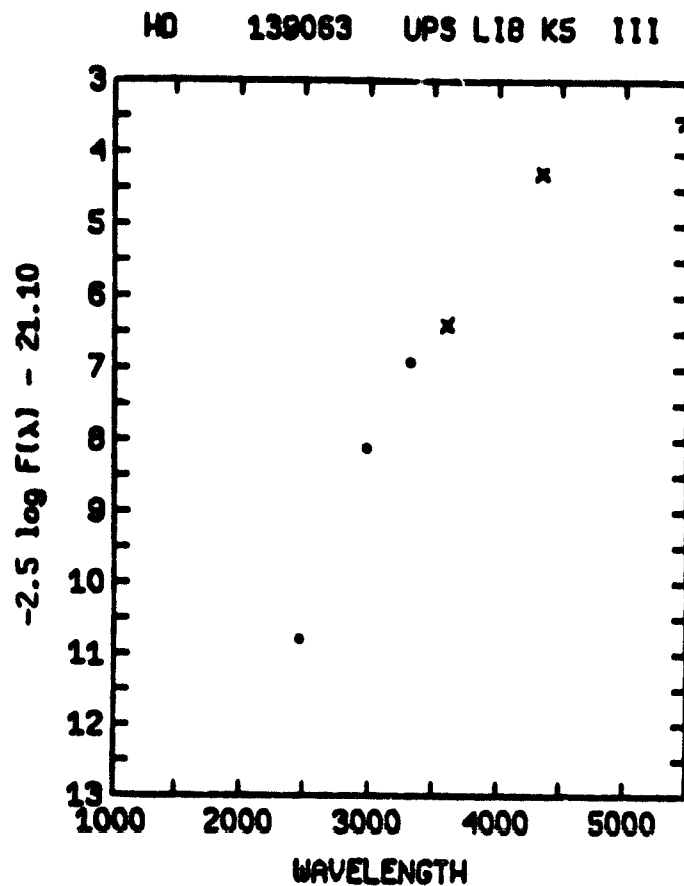
HD 124897 ALF 800 K2 111P TT5-TT7 K2-2.5 stars

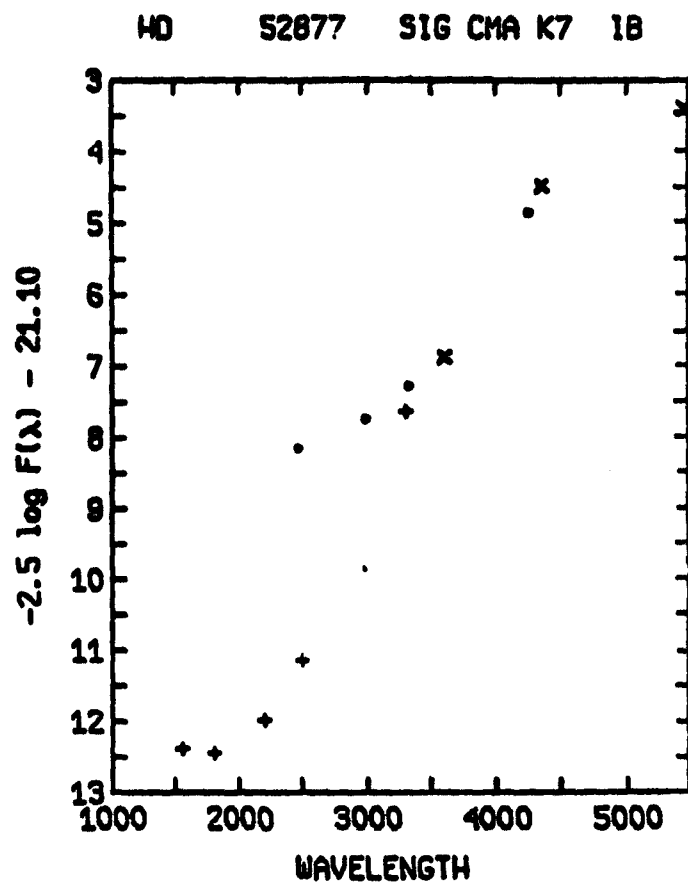
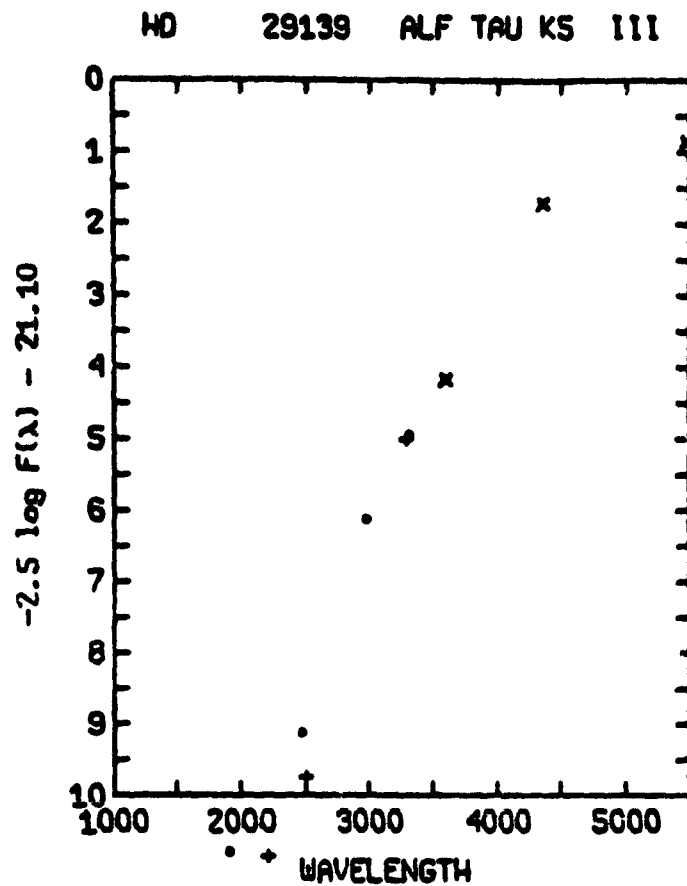
HD 205778 EPS PEG K2 1B



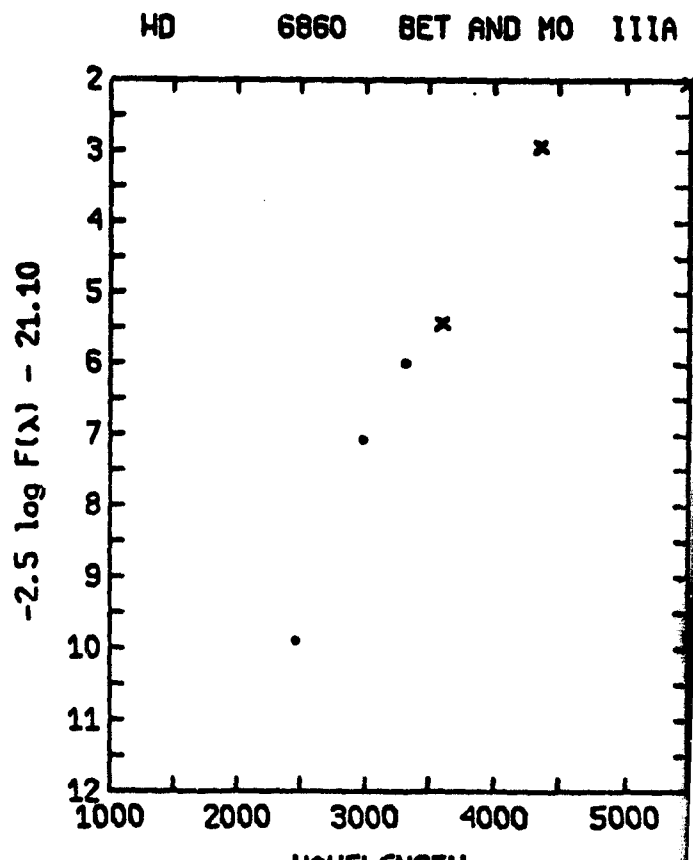
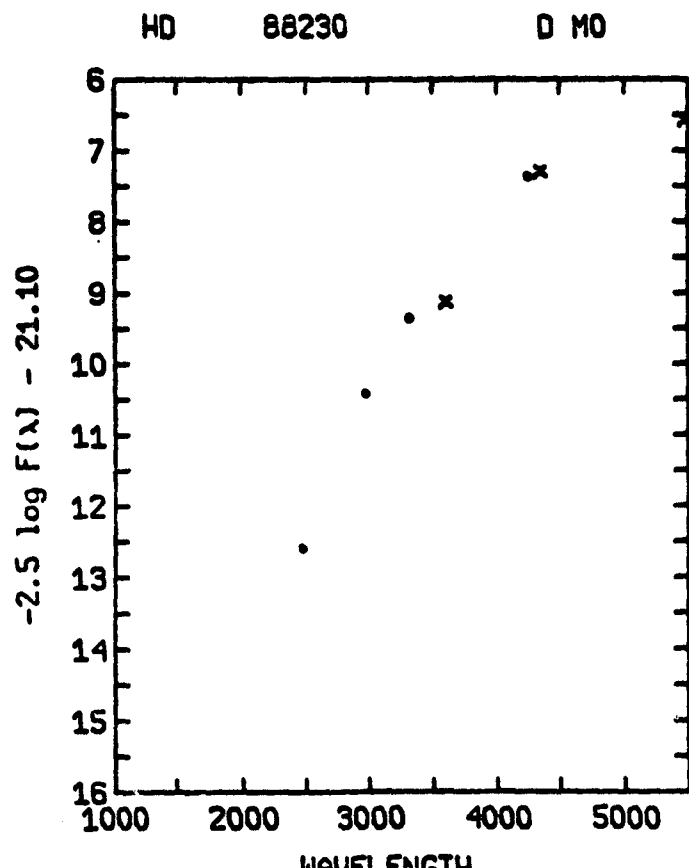
HD 50877 OMI1CMA K2.51AB







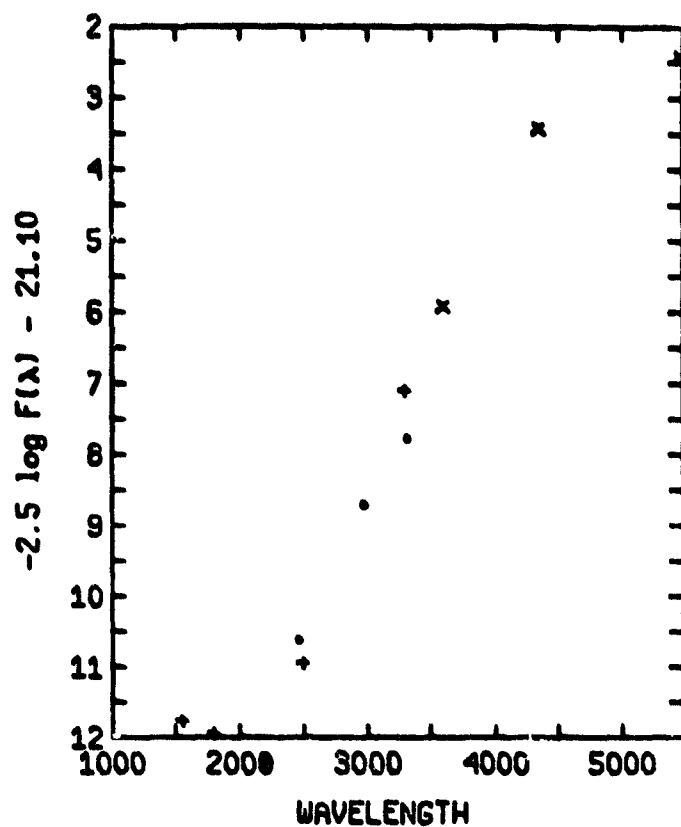
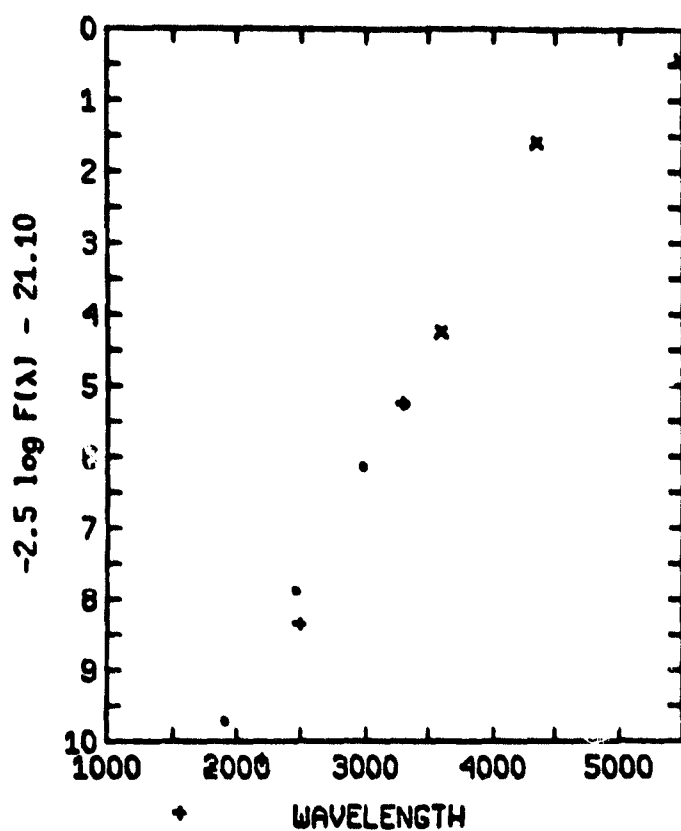
M stars
VV1-VV2



M stars
VV3-VV4

HD 39801 ALF ORI M1-21A-18

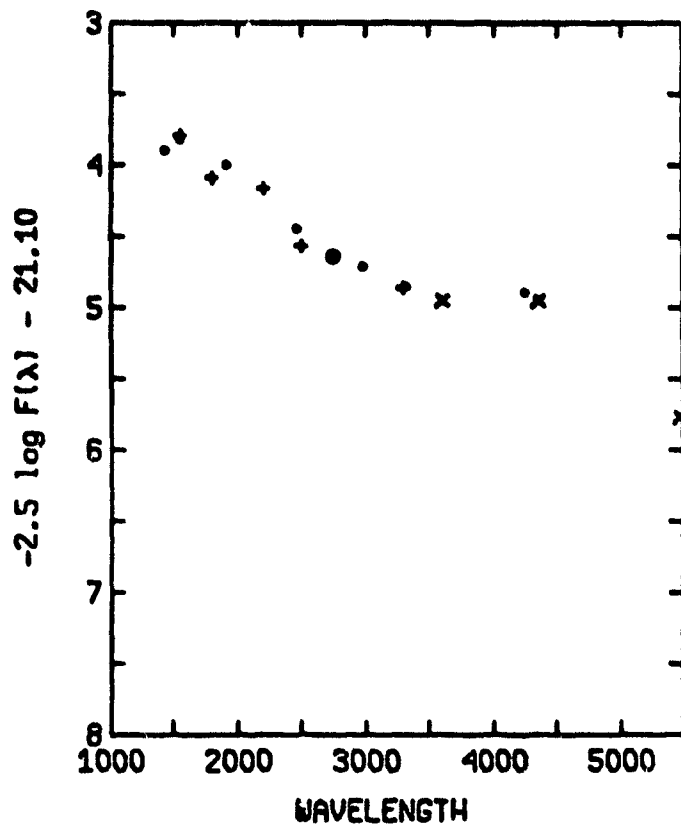
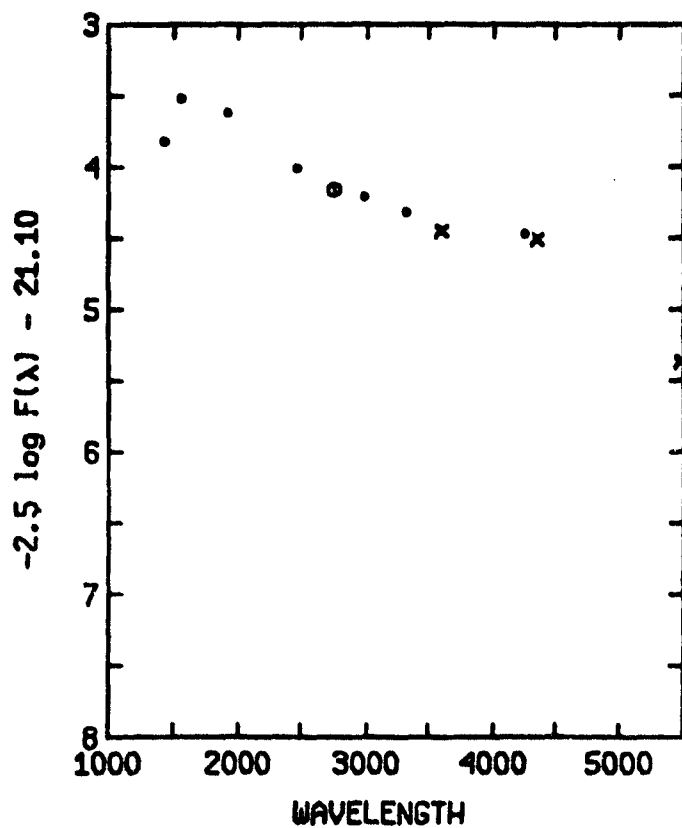
HD 217906 BET PEG M2.511-111

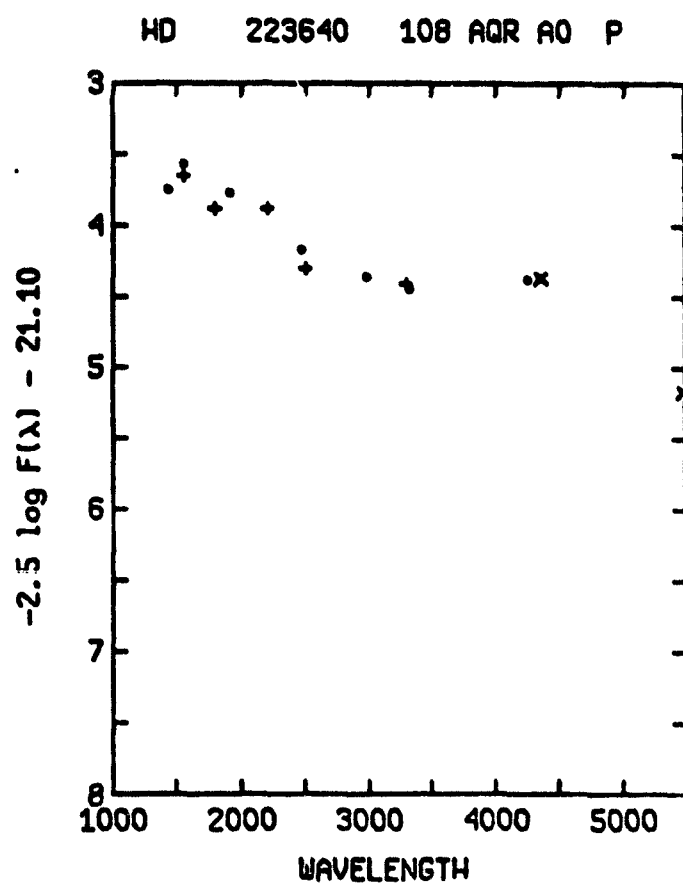
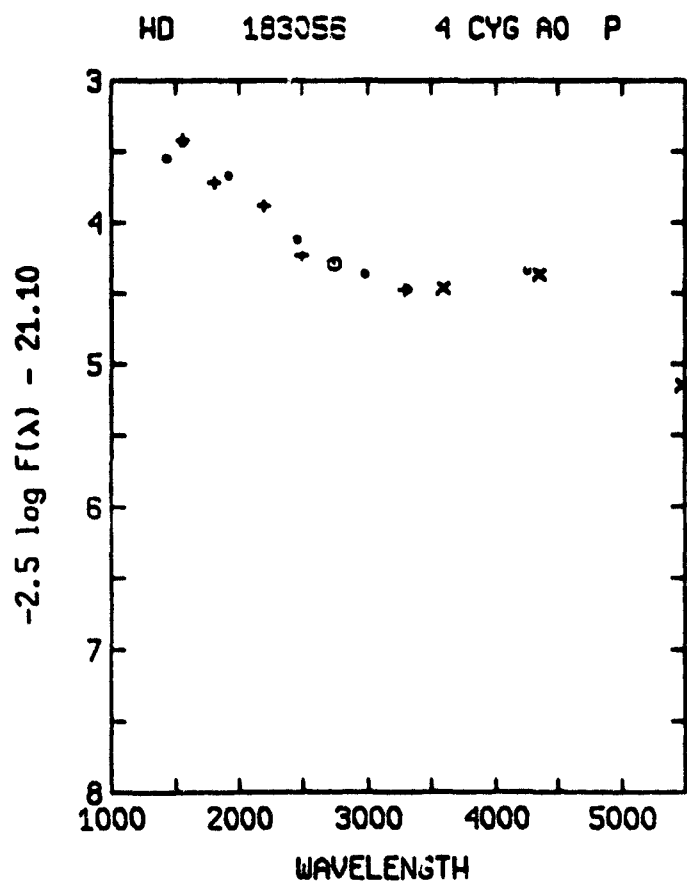
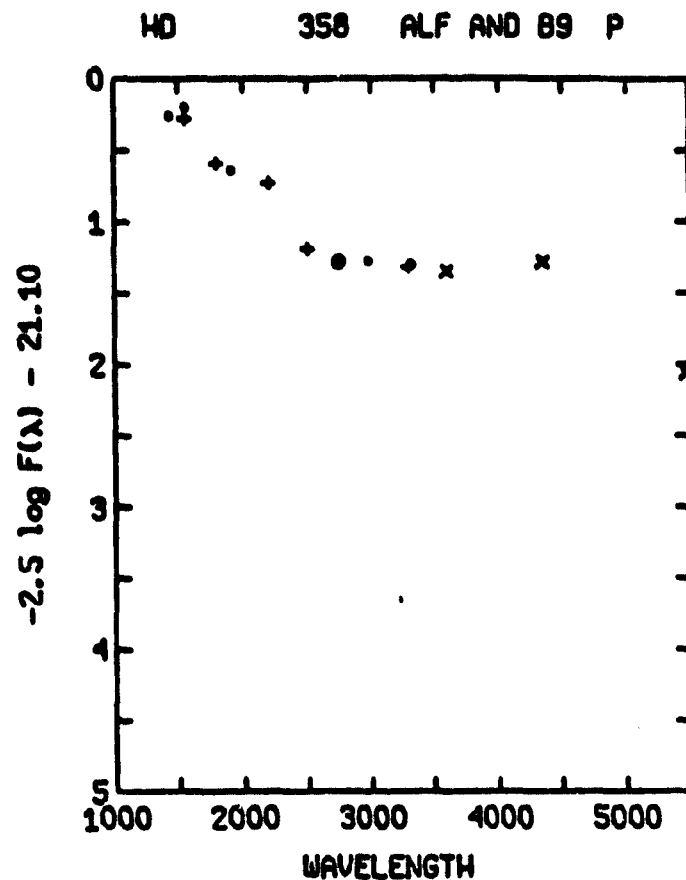
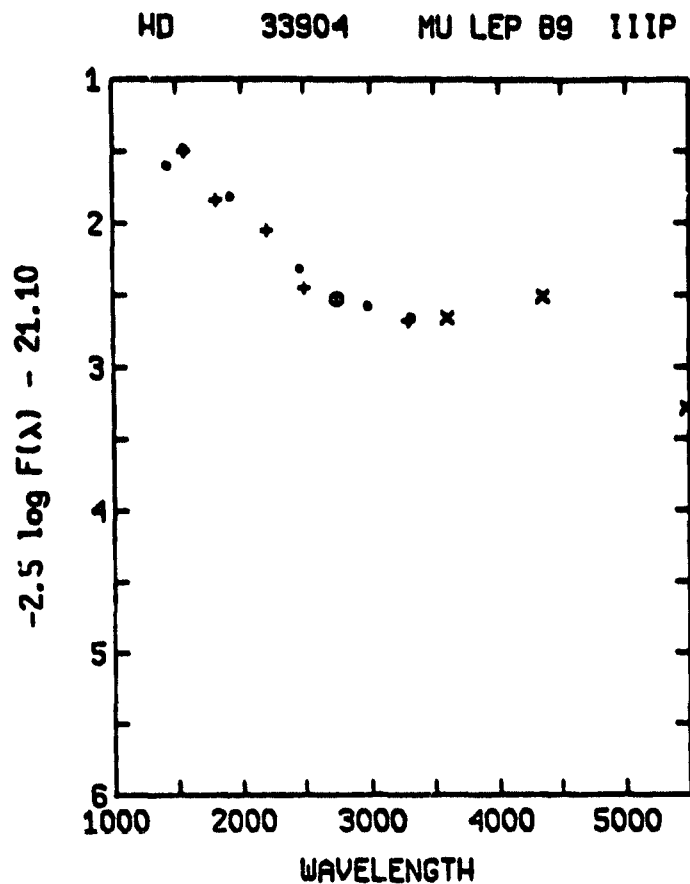


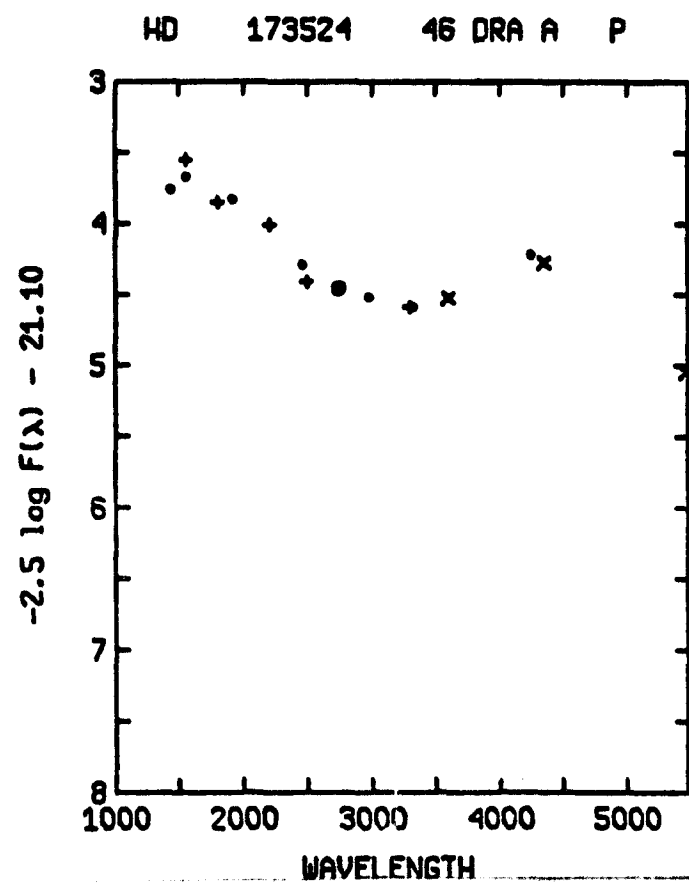
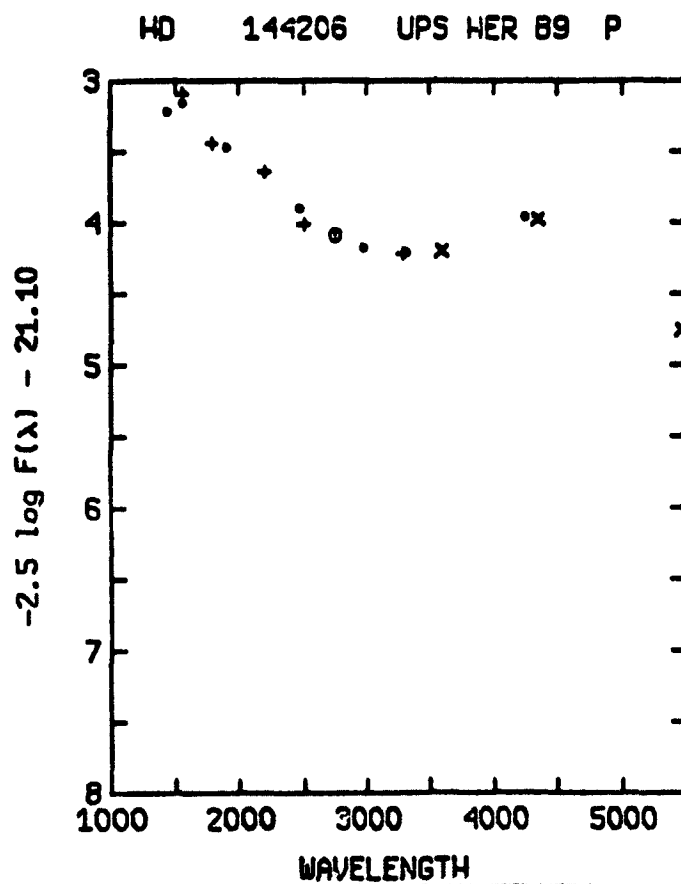
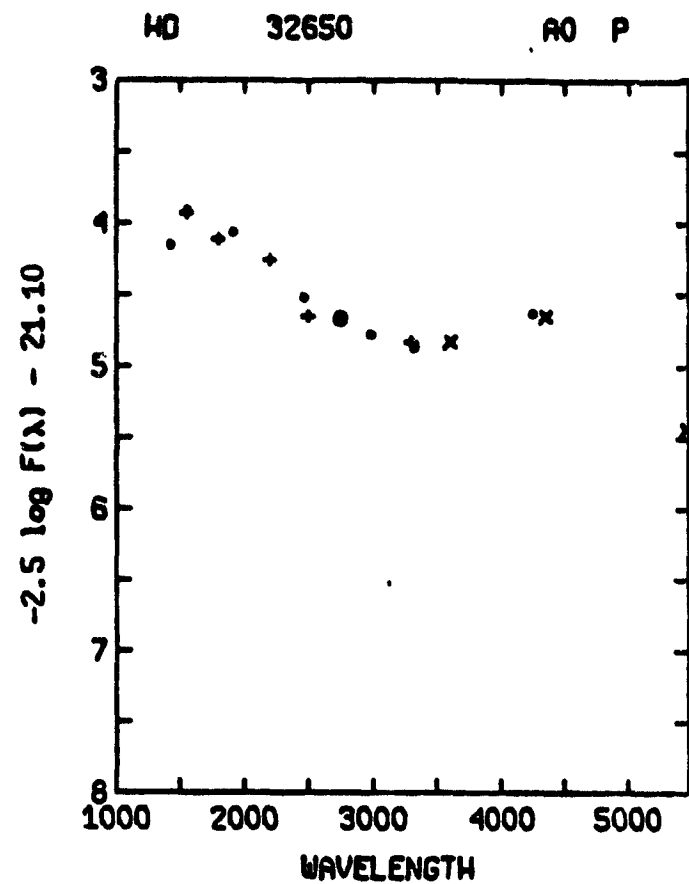
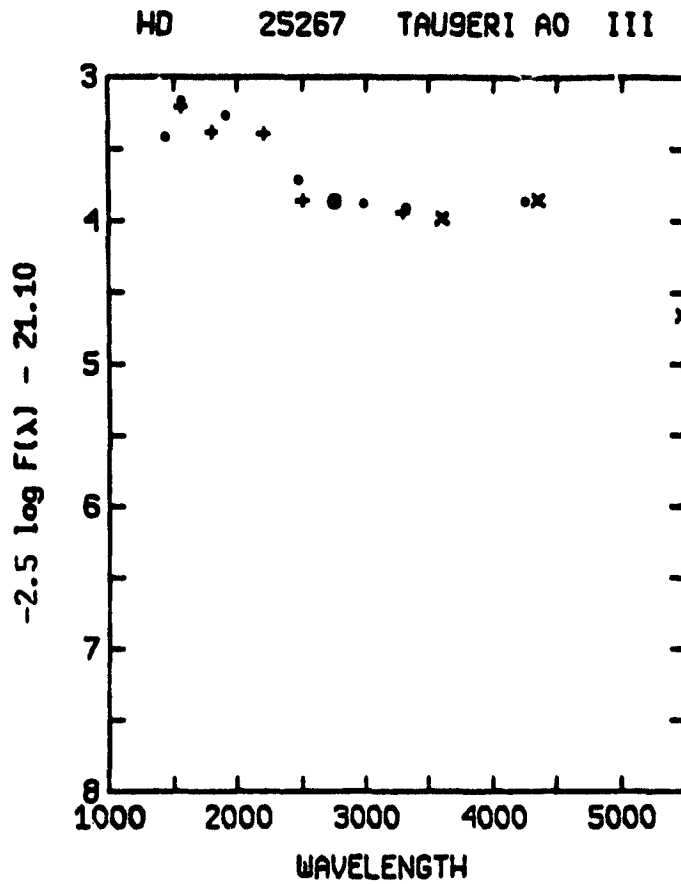
B8-A2 peculiar stars
WW1-WW2

HD 34452 A0 P

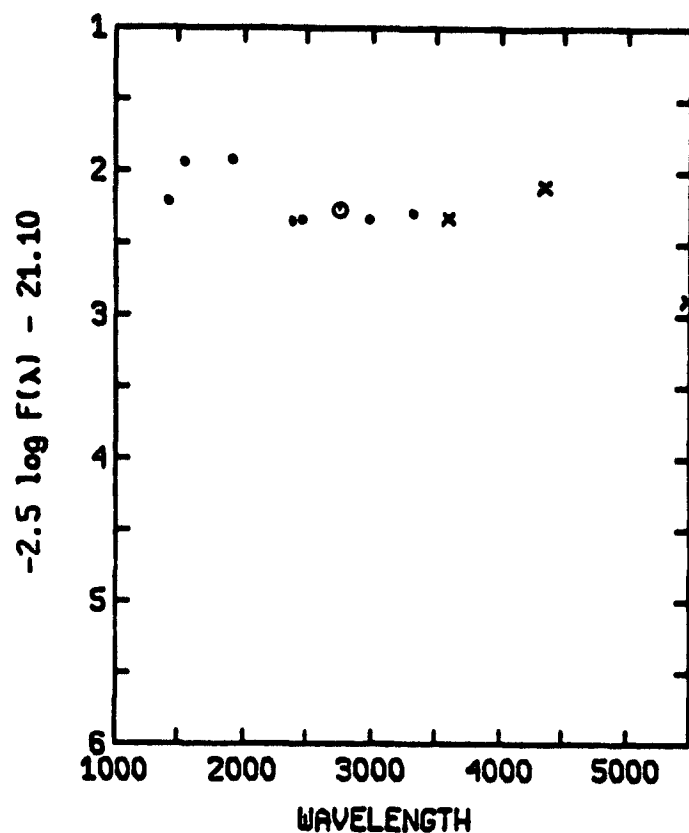
HD 196178 B8 P



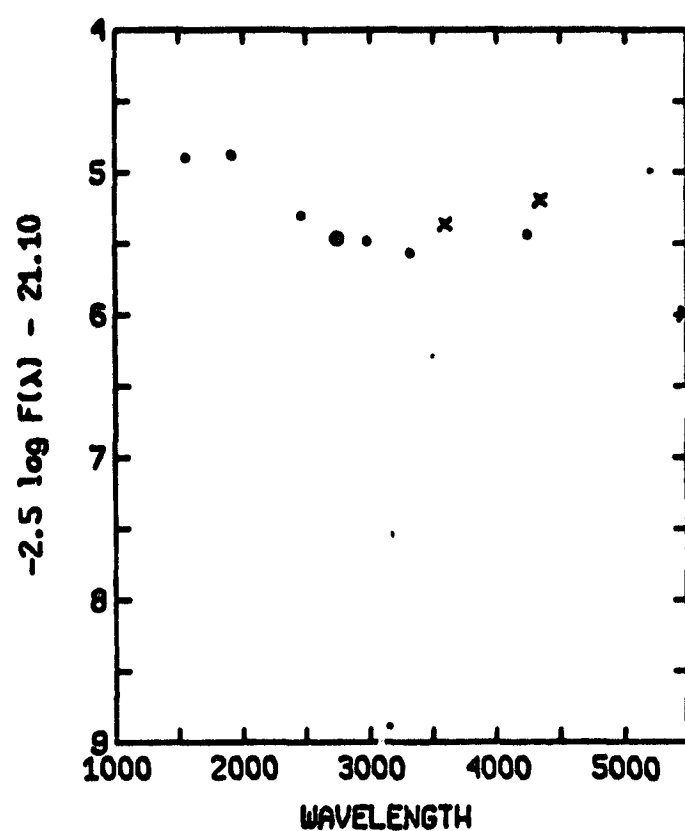




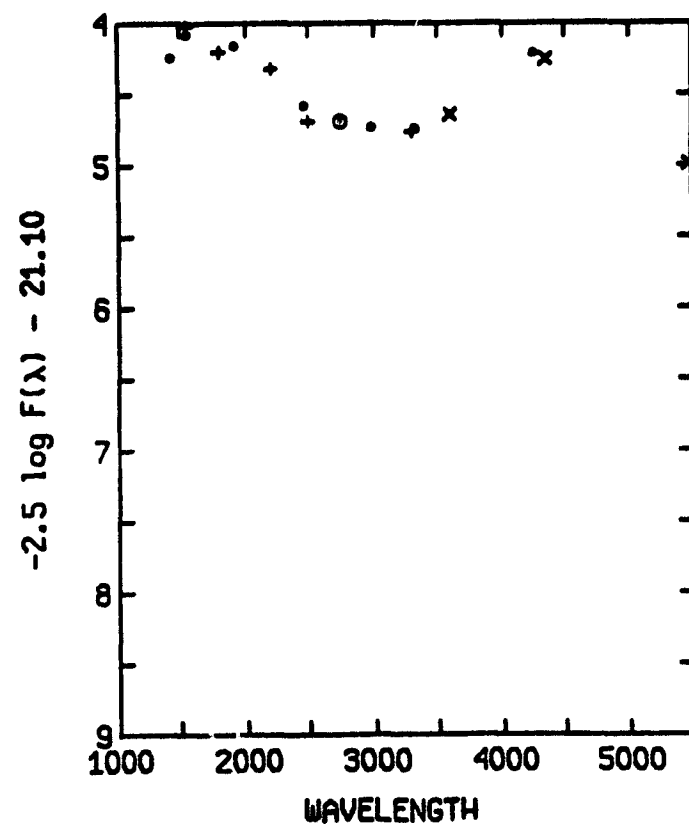
HD 112412/3 ALF CVN A P



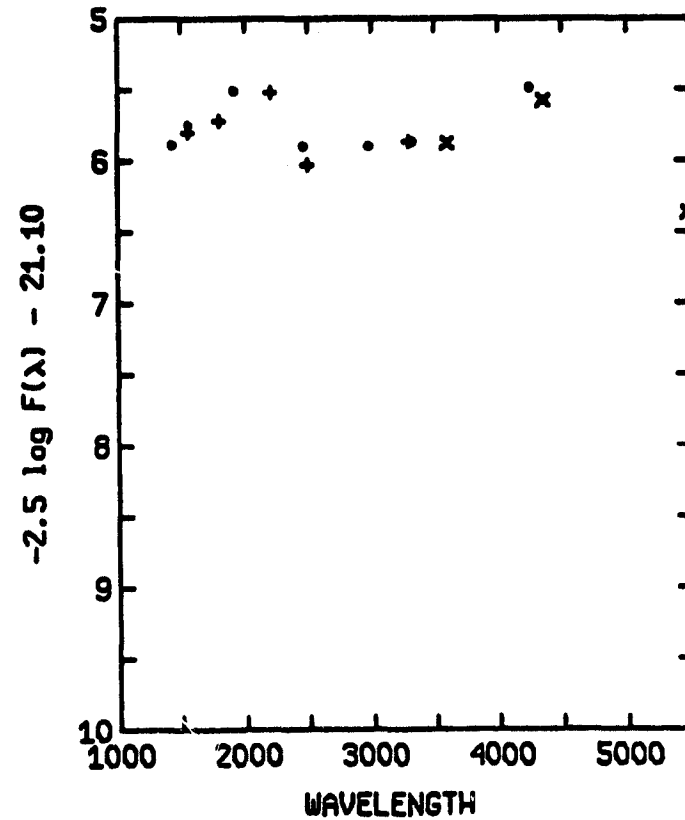
HD 199728 20 CAP A0 P

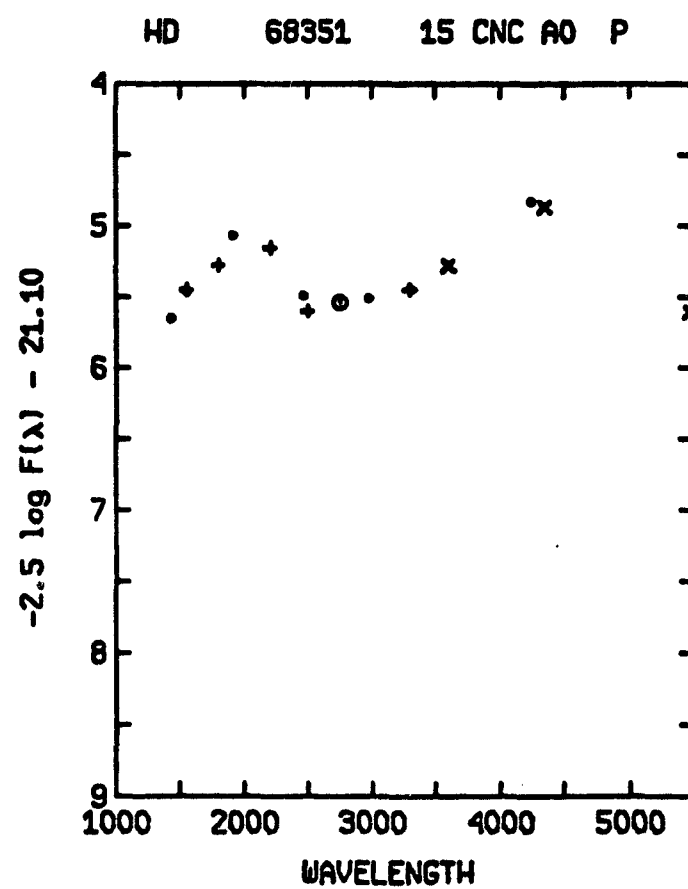
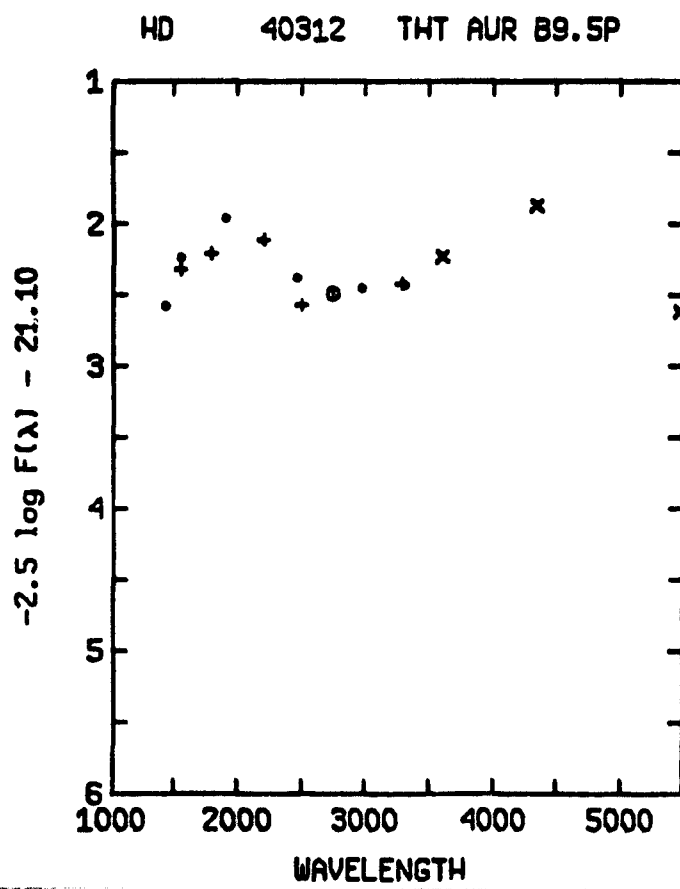
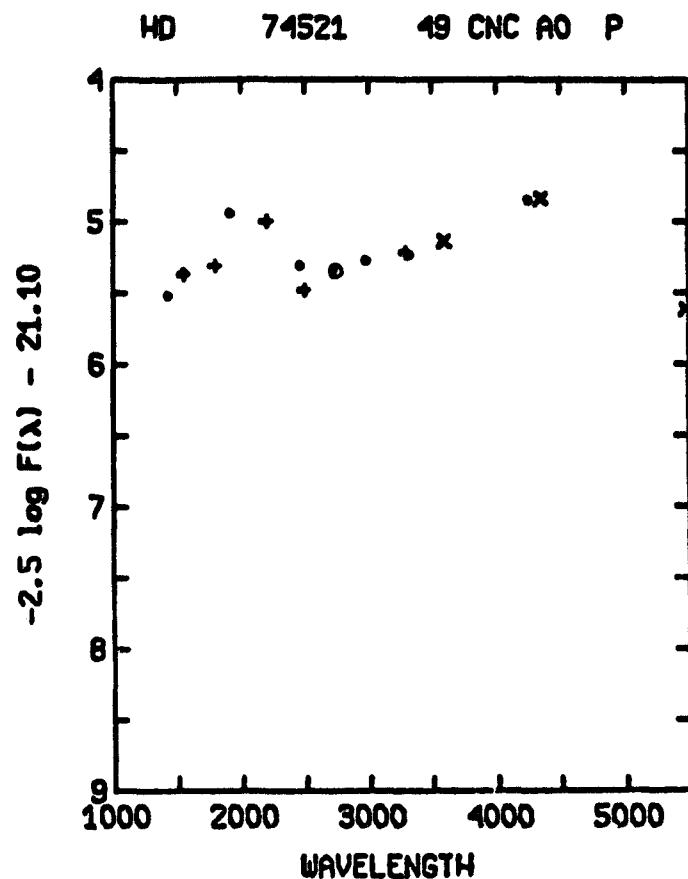
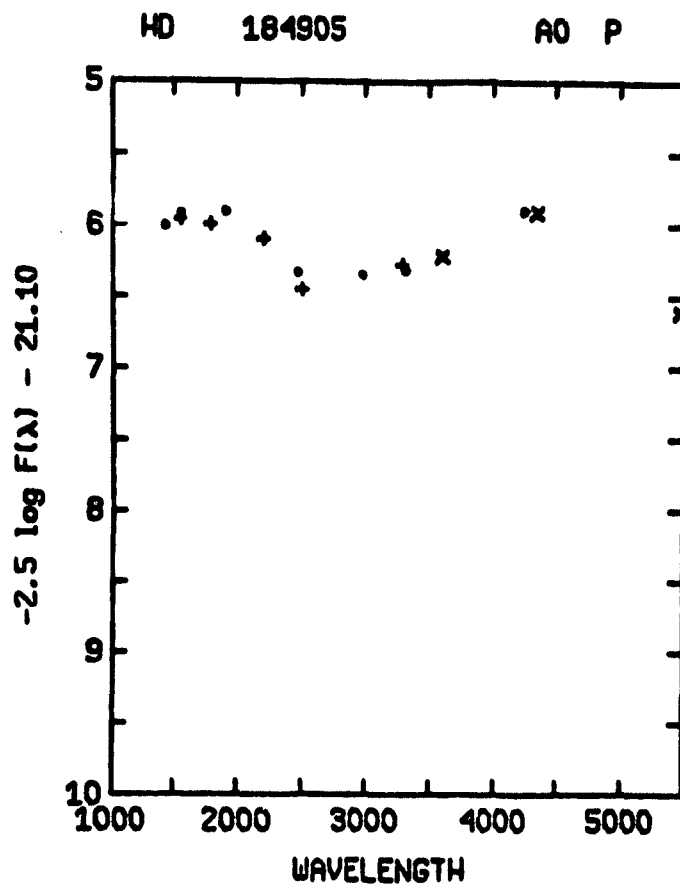


HD 89822 A0 P



HD 133029 A0 P



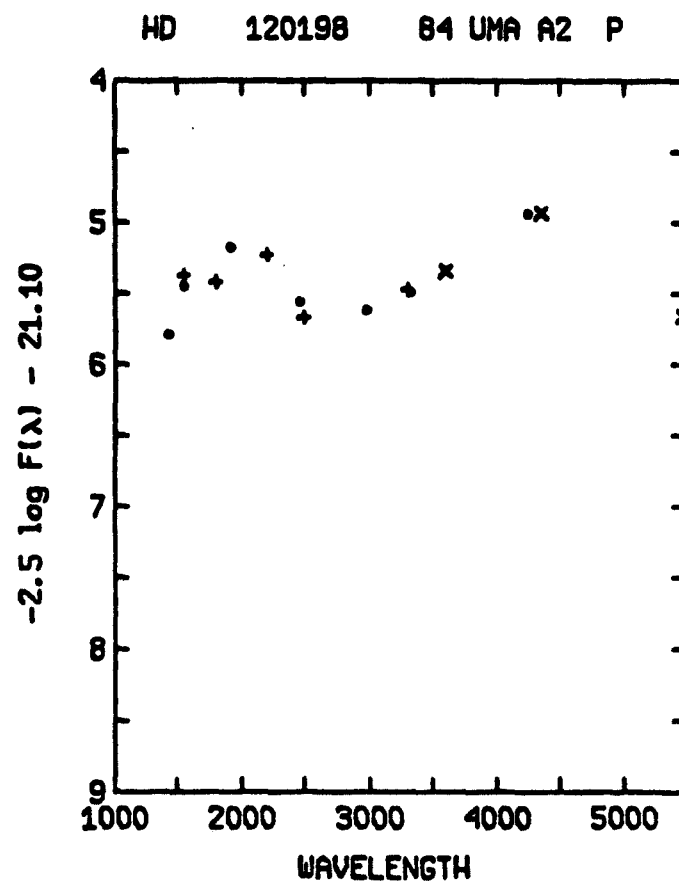
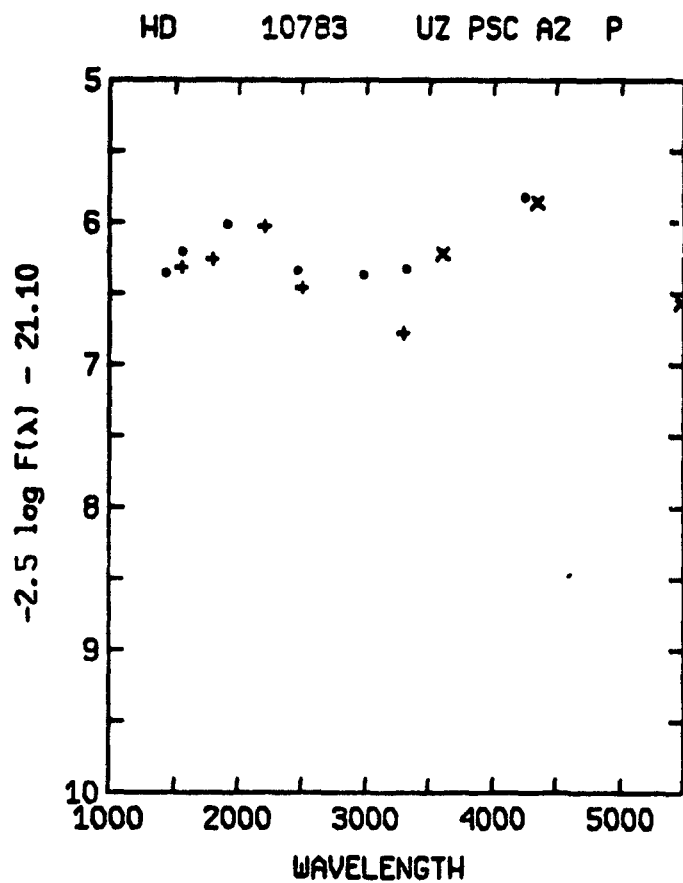
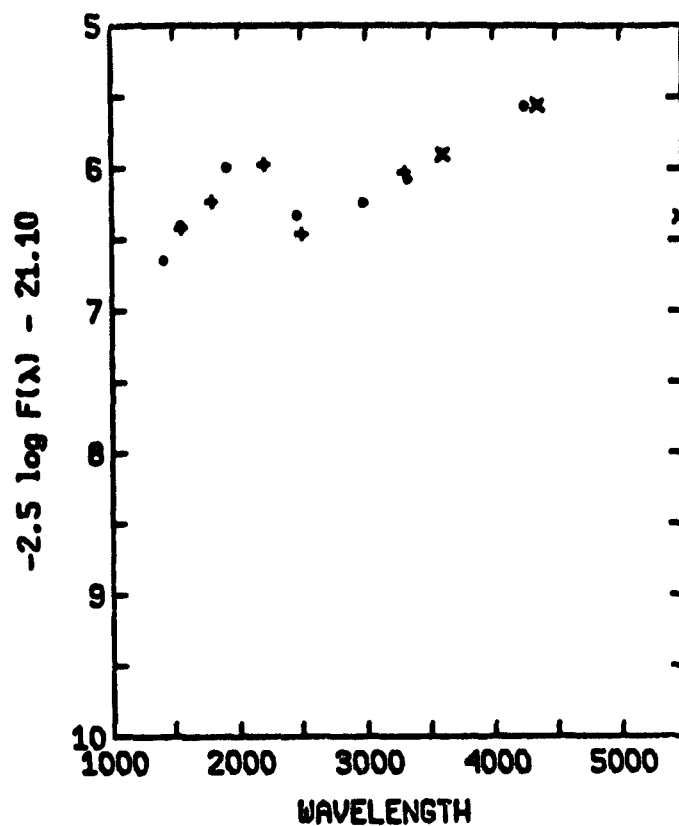
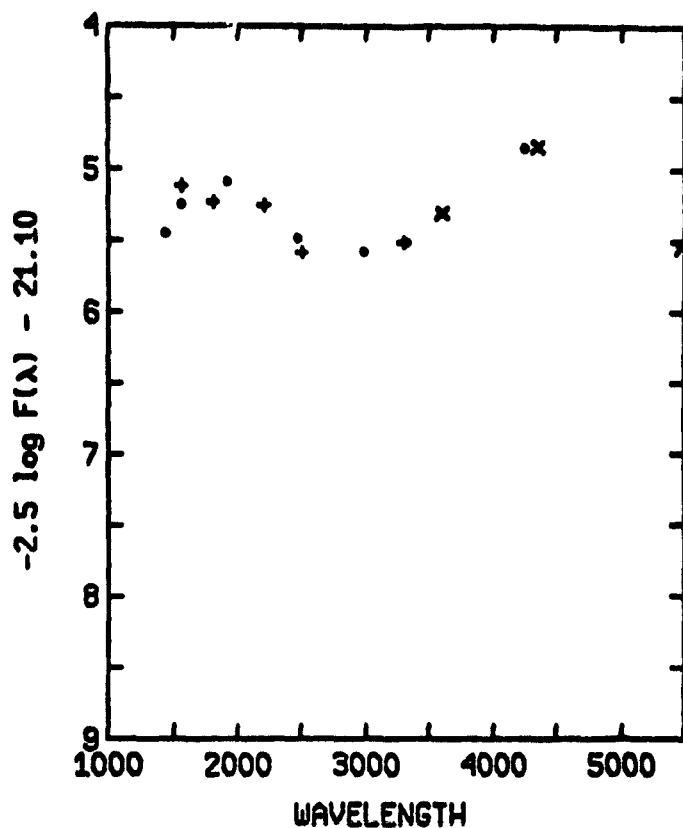


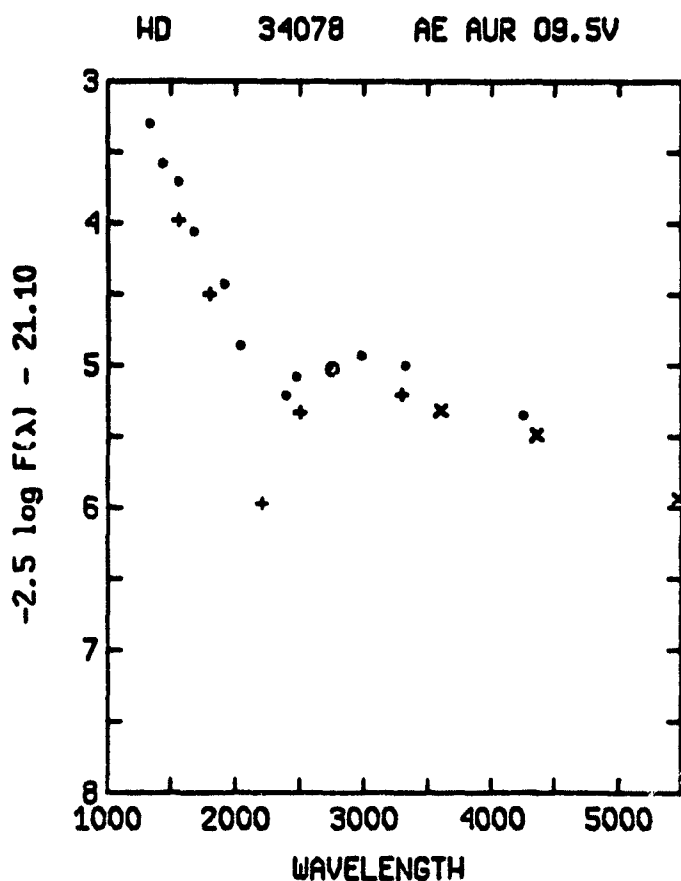
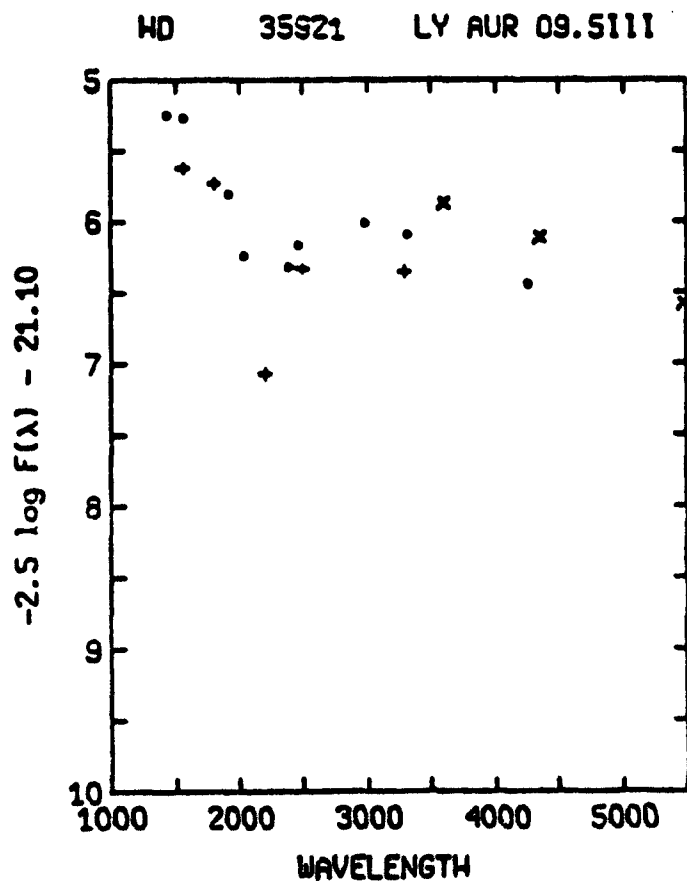
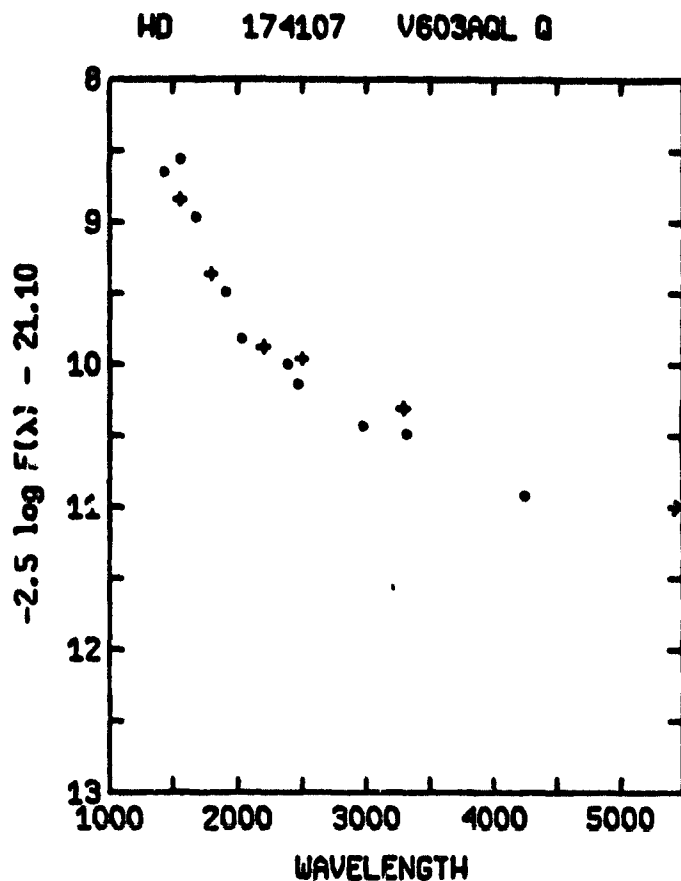
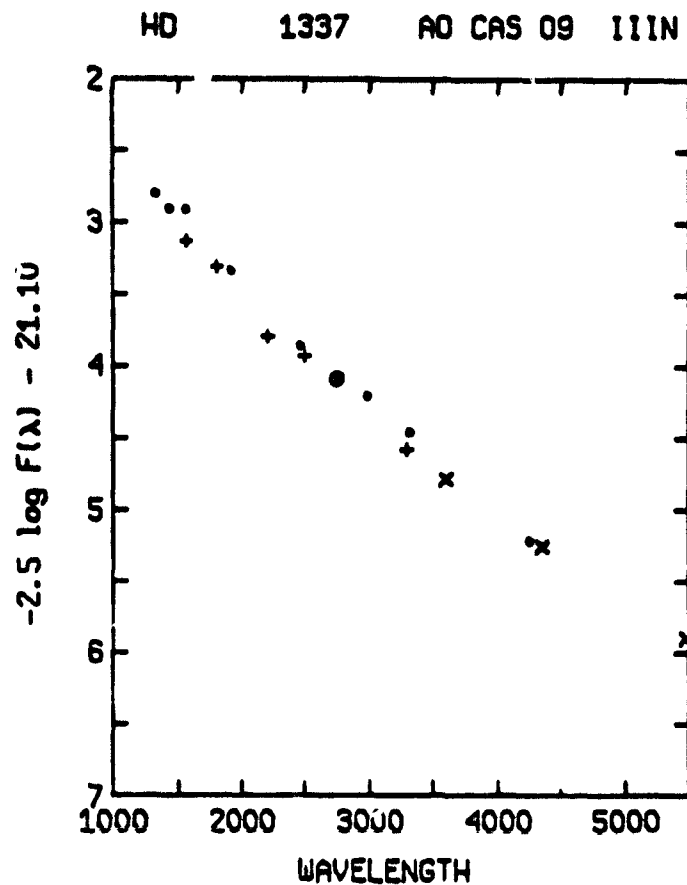
HD 39317 137 TAU B9 P

WW19-WW22

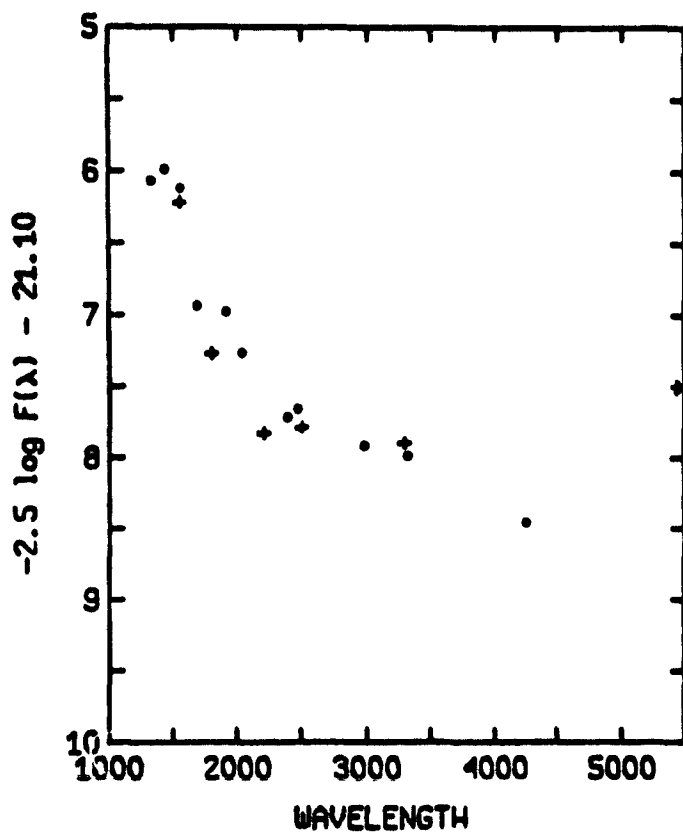
HD 149822

A0 P

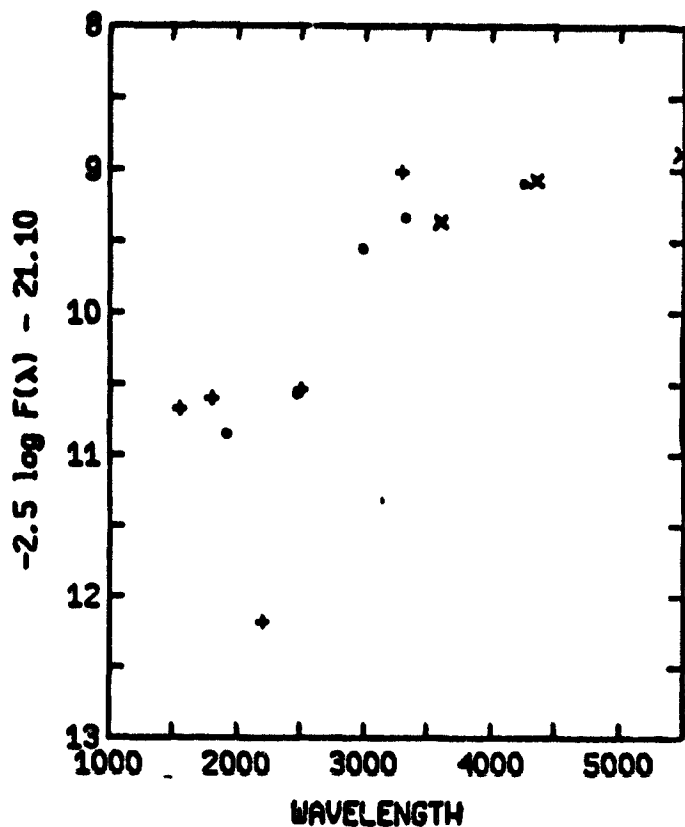




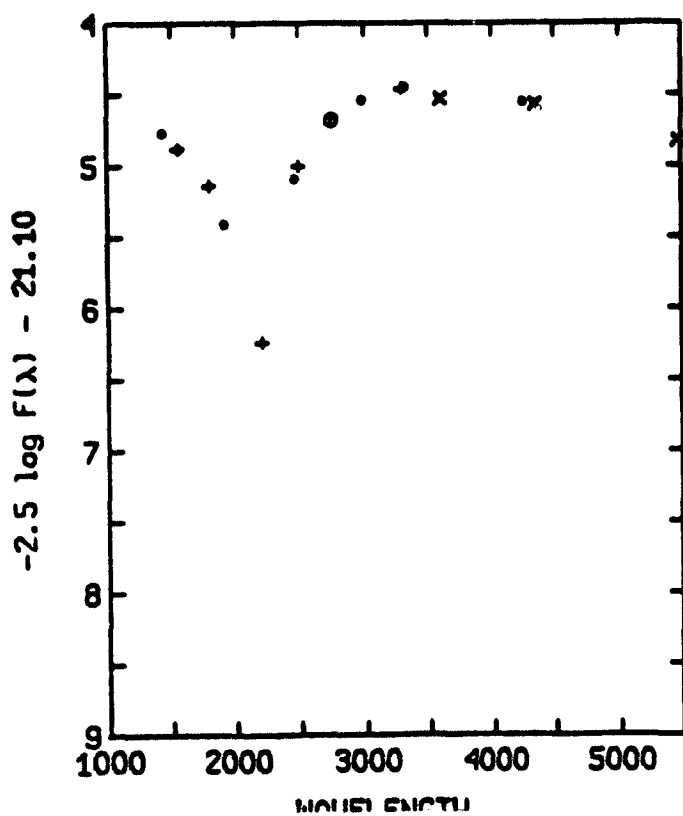
HD 207757 AG PEG 8 EP



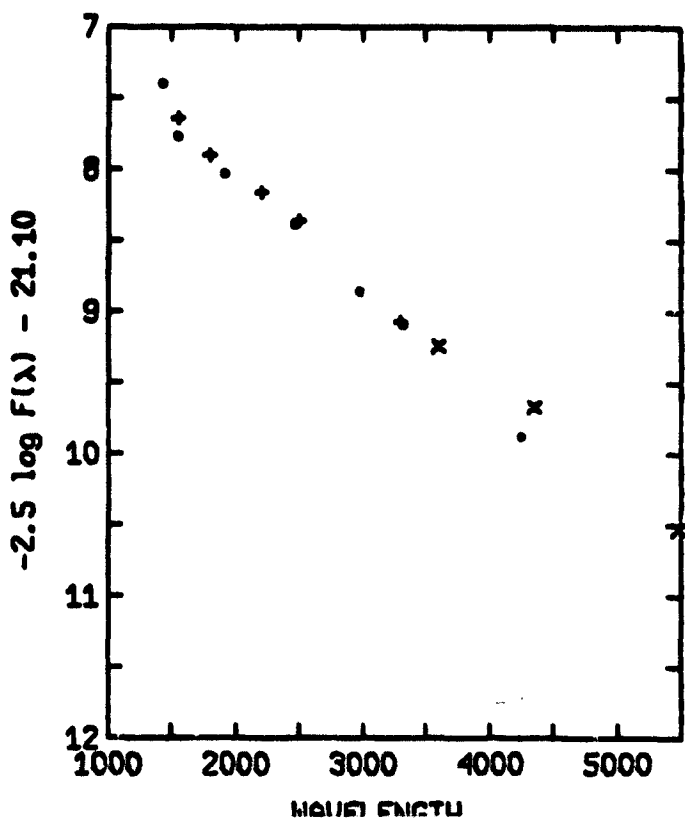
HD E226888 V1357CYG 80 18



HD 193237 P CYG 81 PE

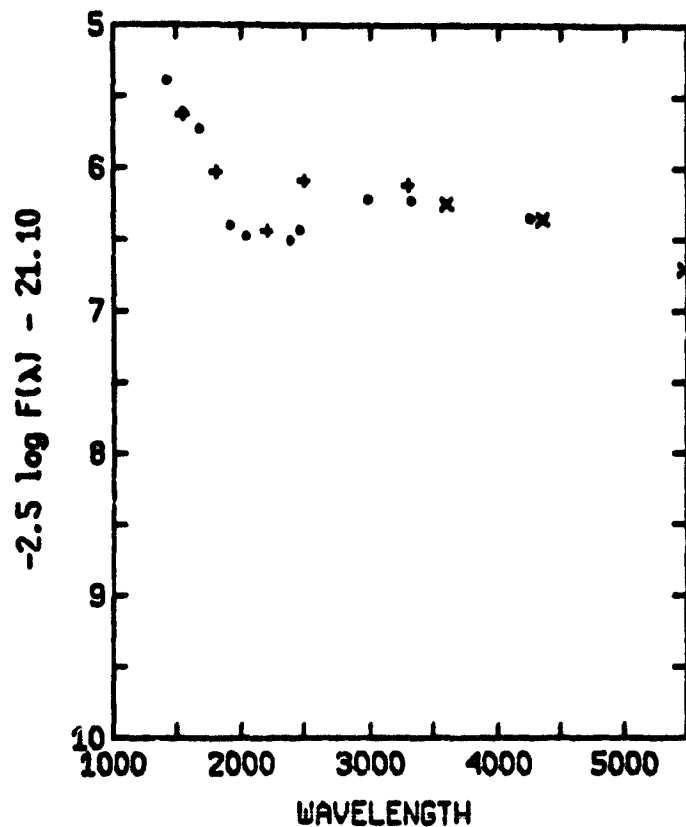


+13° 3224 81 P

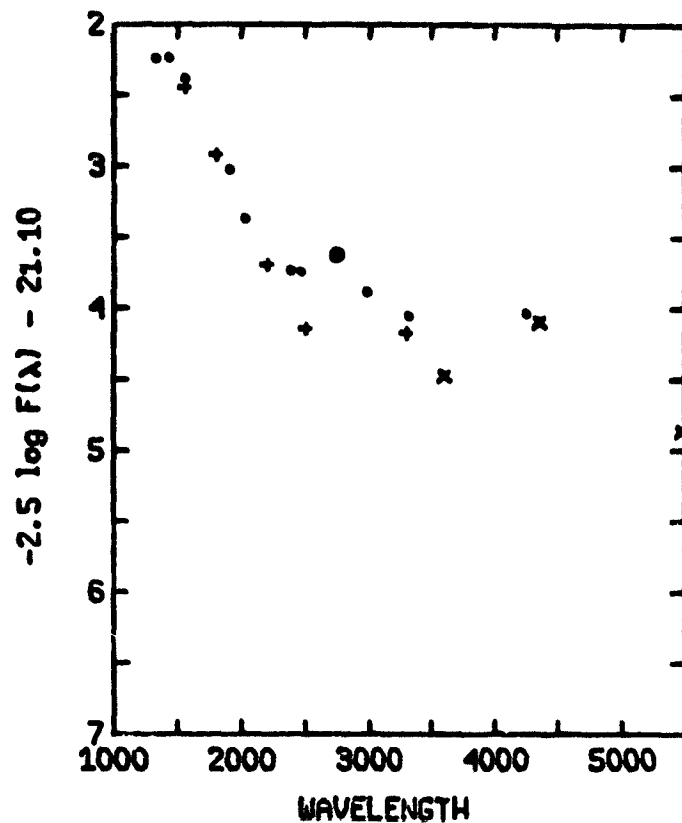


Variables
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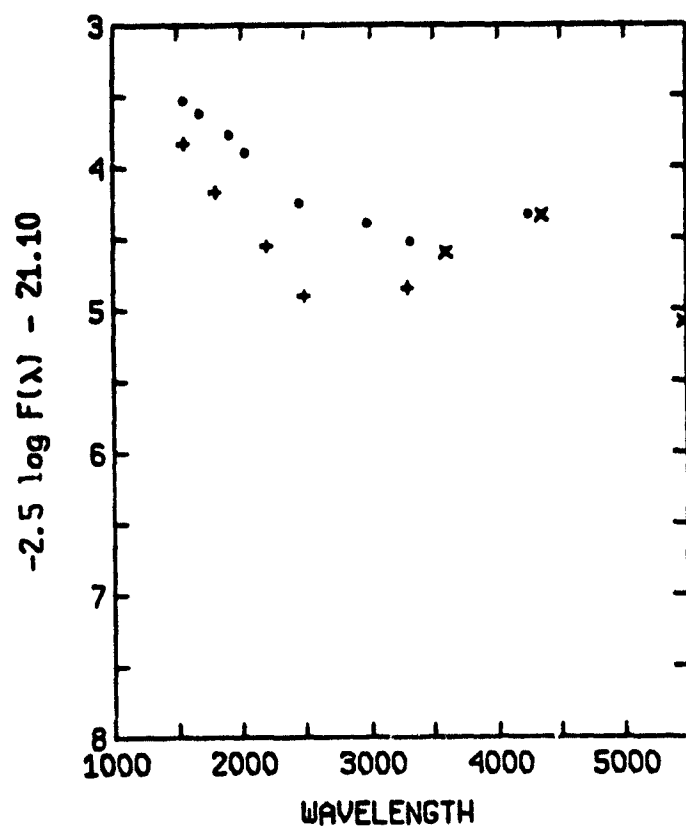
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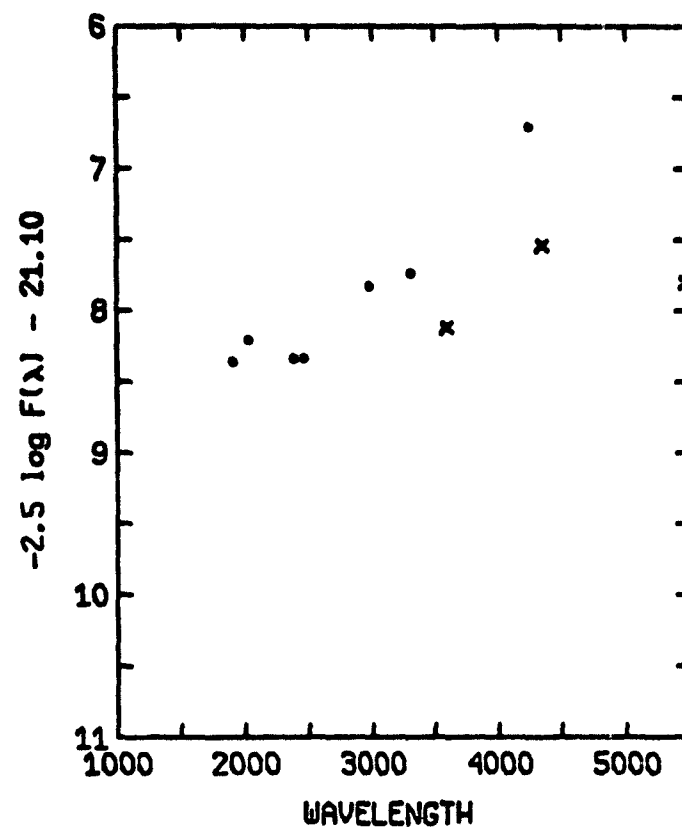
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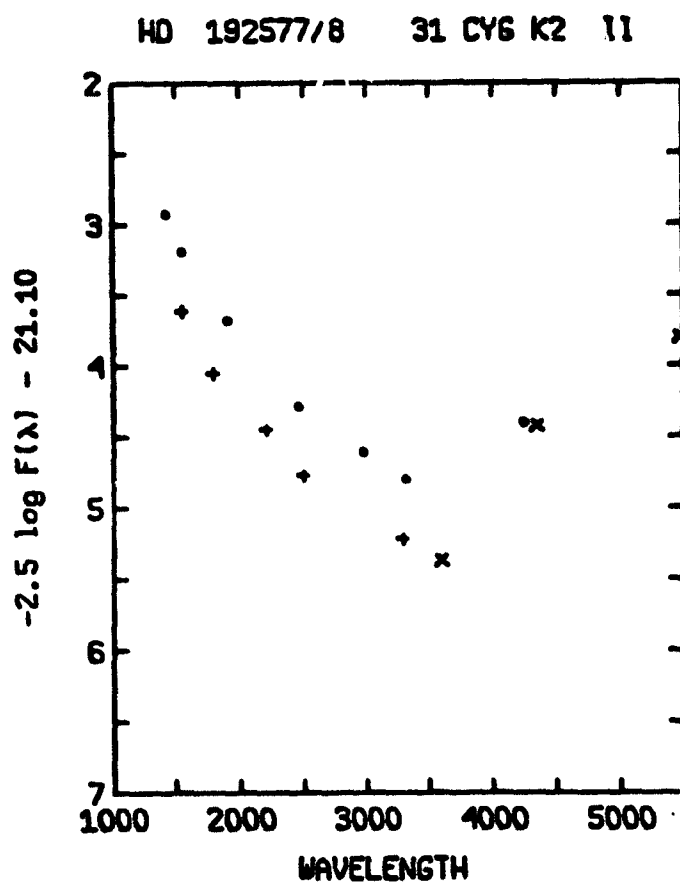
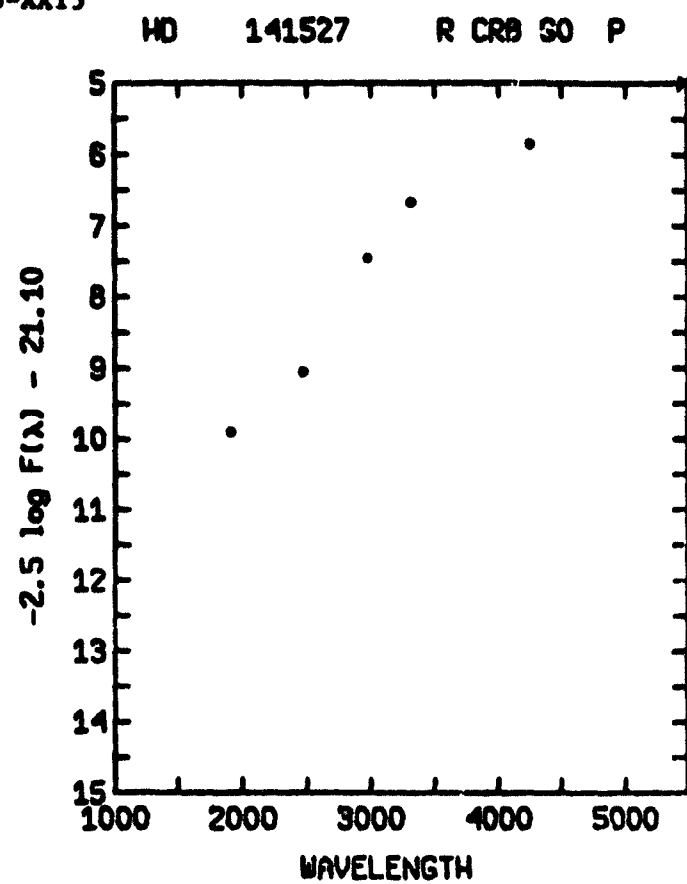
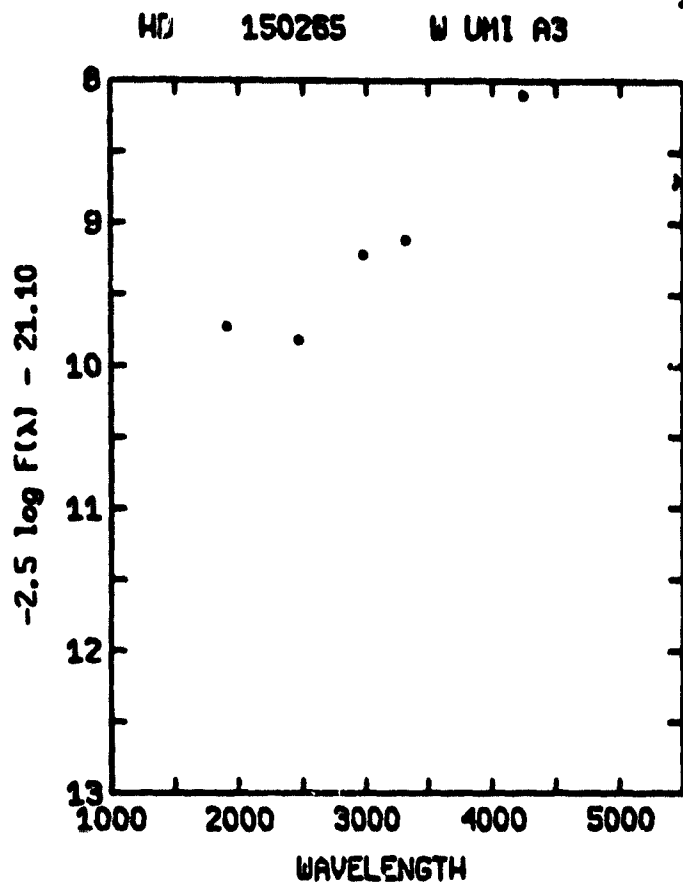
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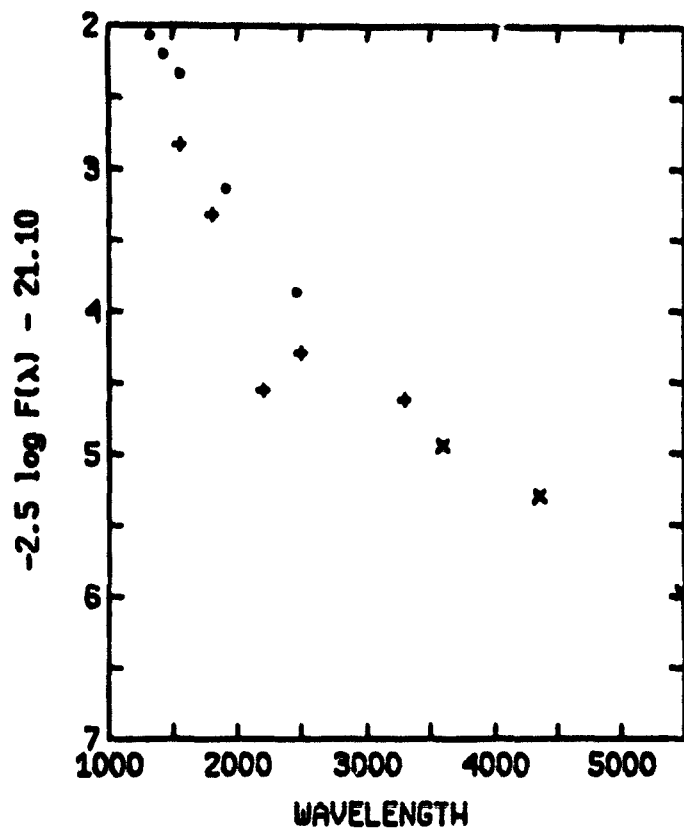
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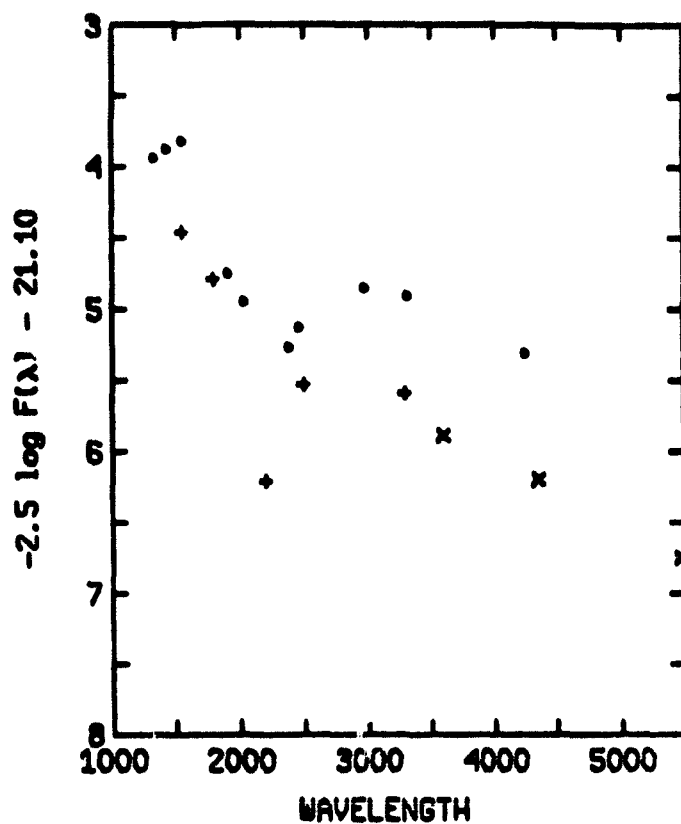
Variables
XX13-XX15



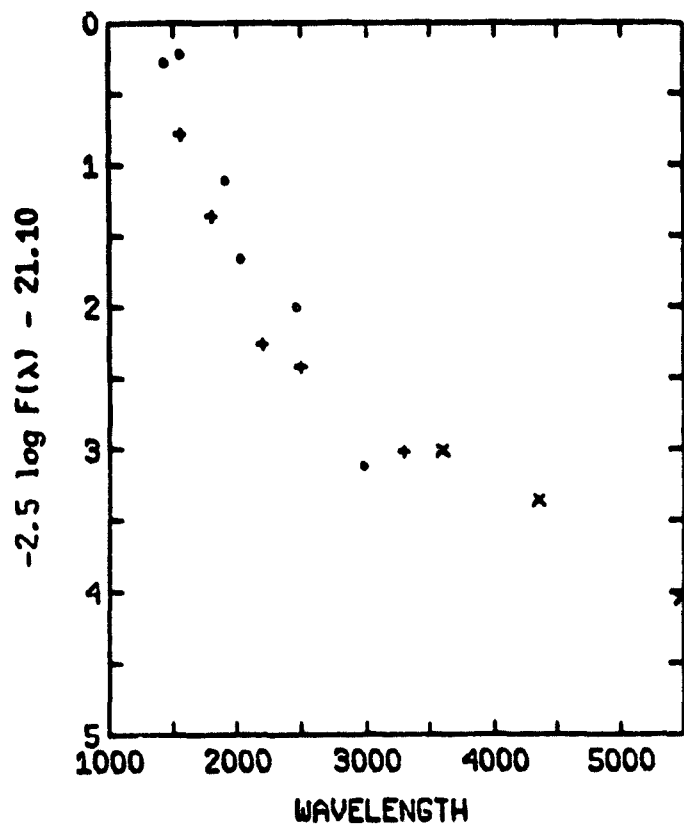
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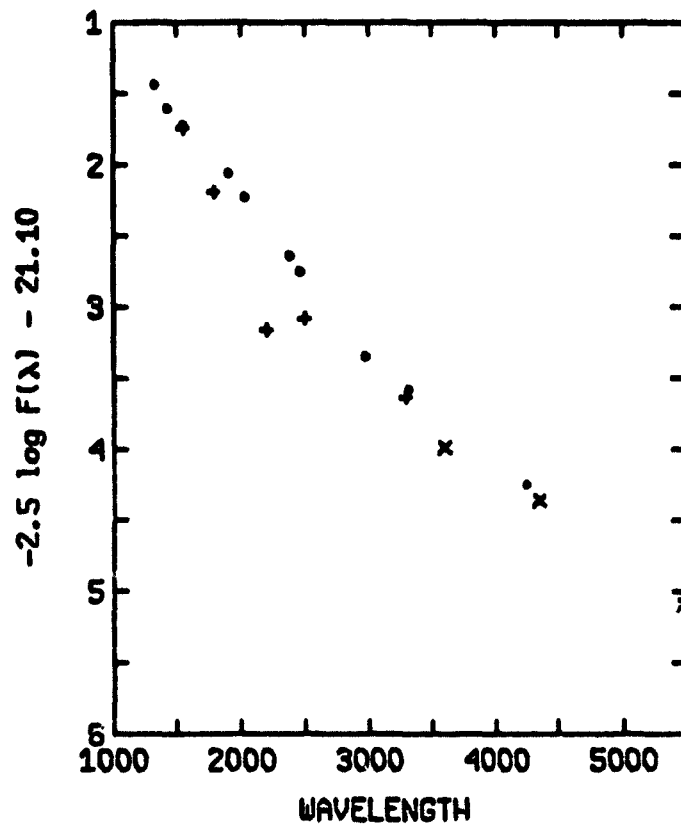
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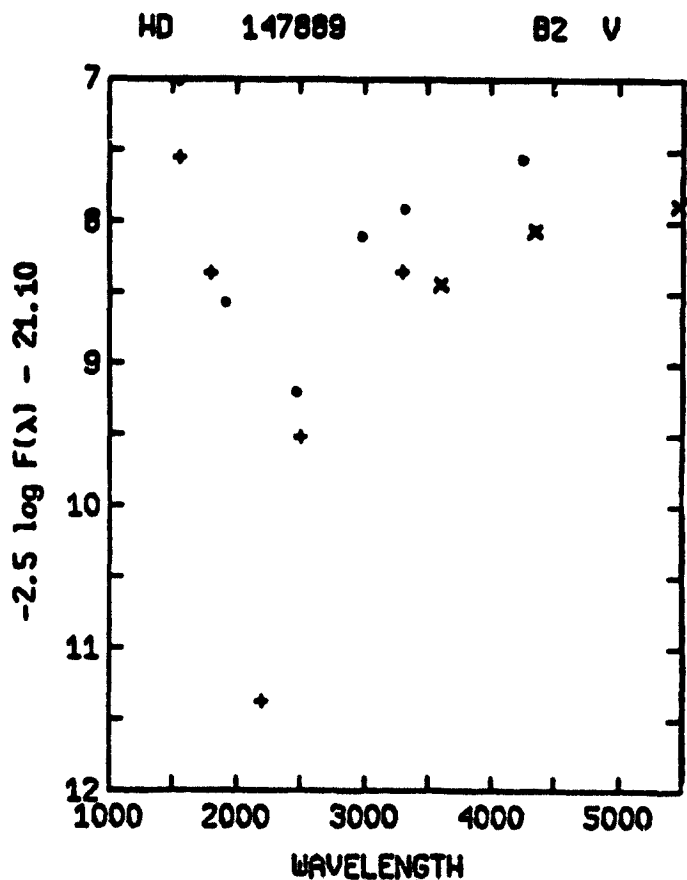
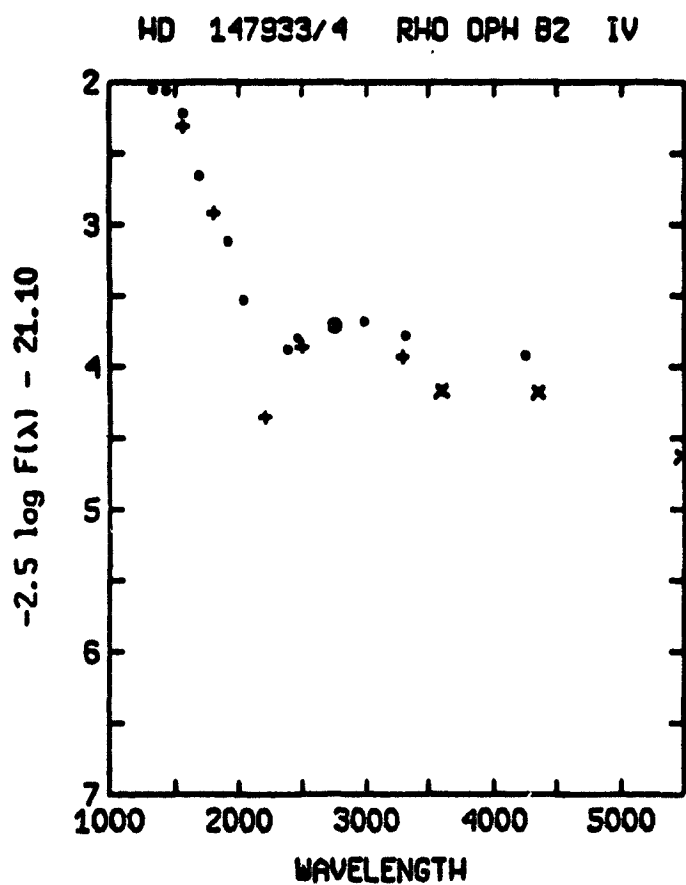
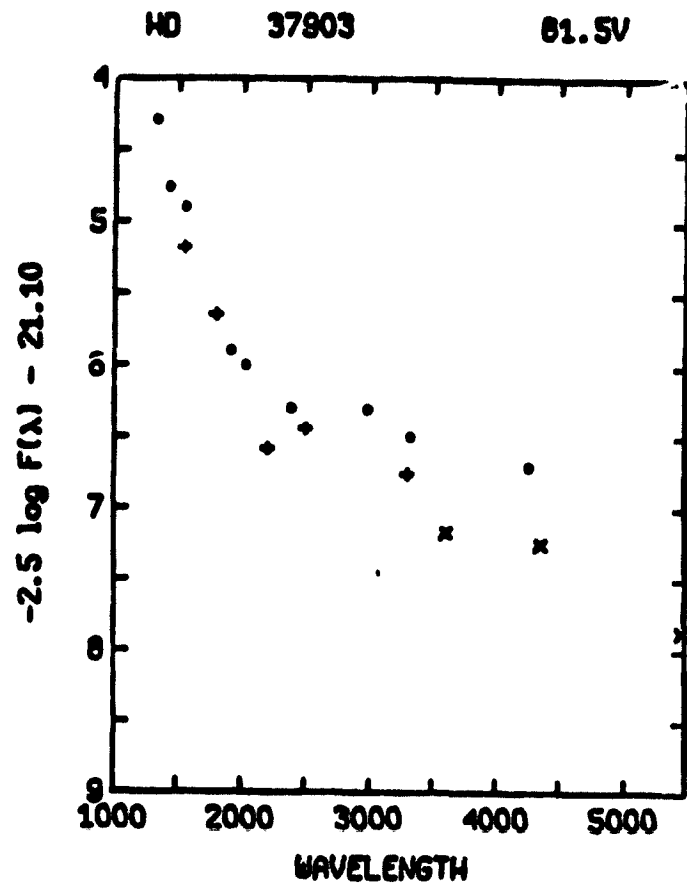
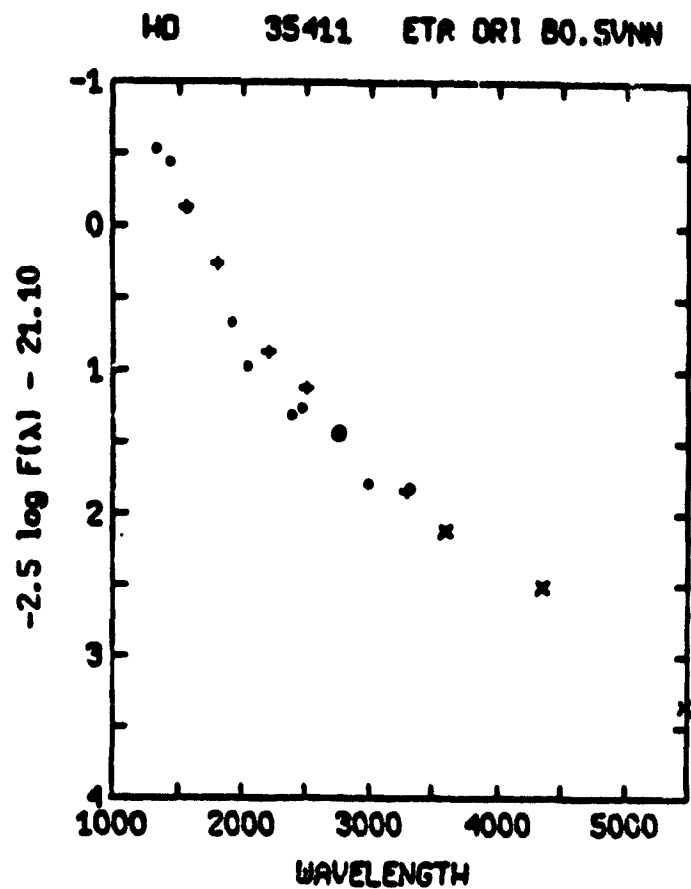


HD 37020/42 THT ORI 06EP-08

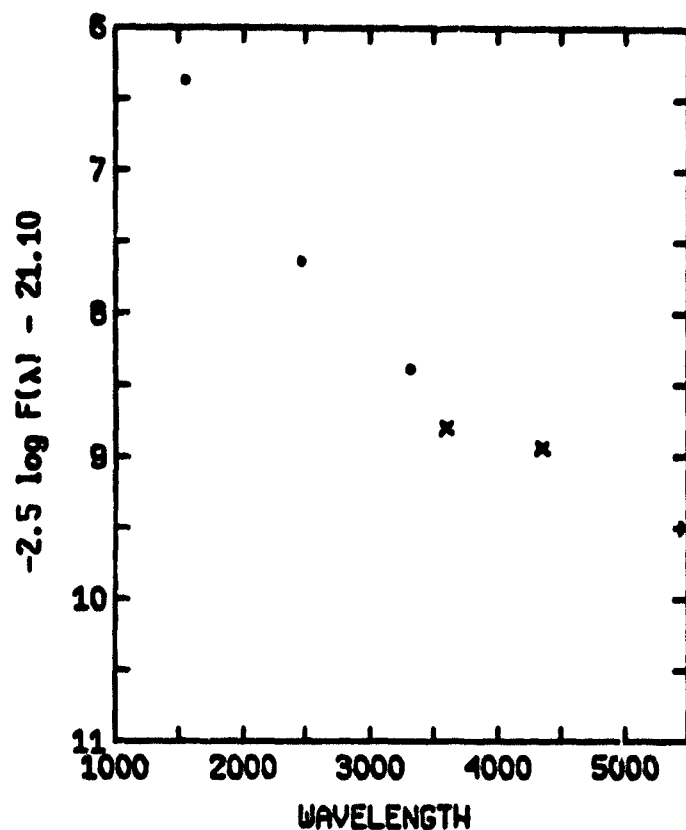


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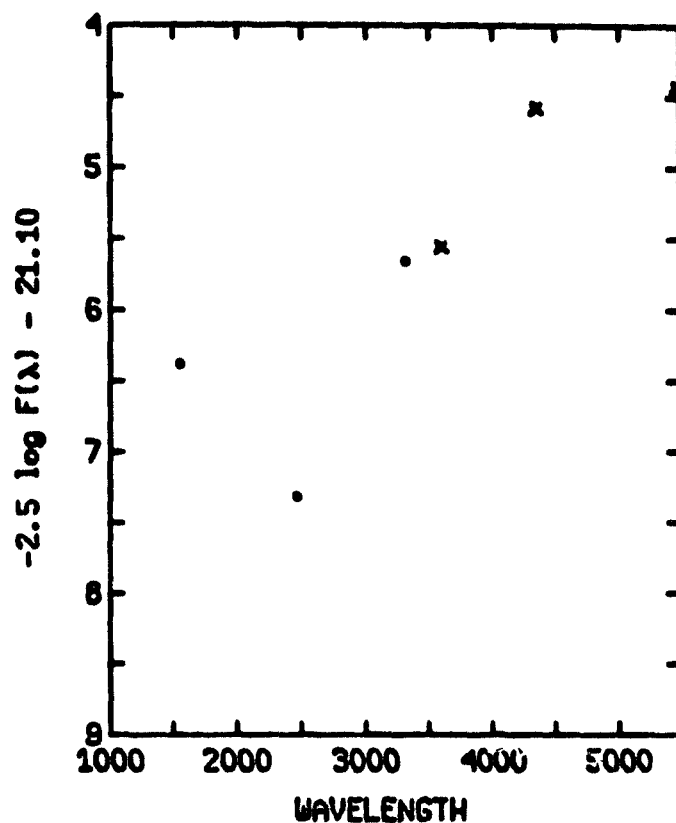




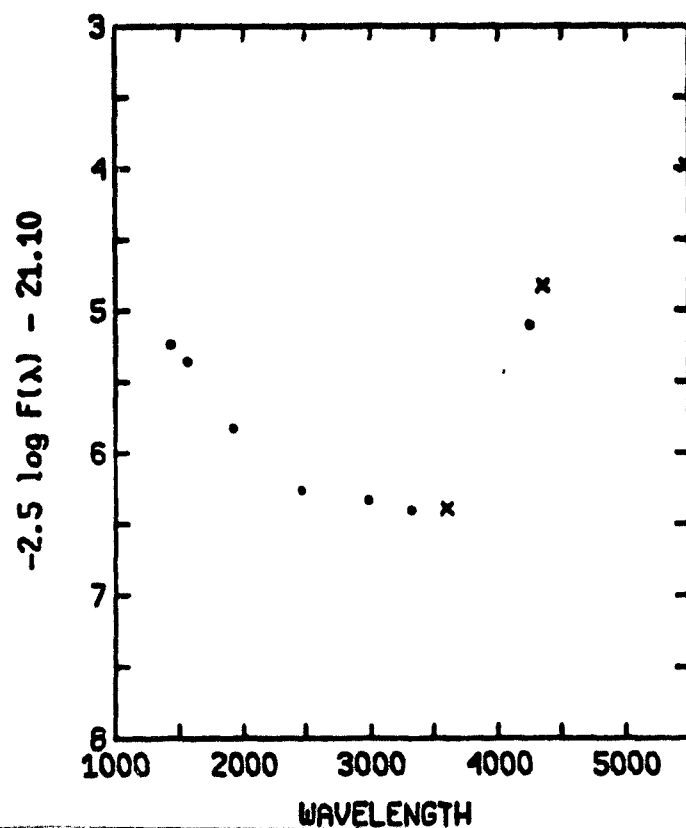
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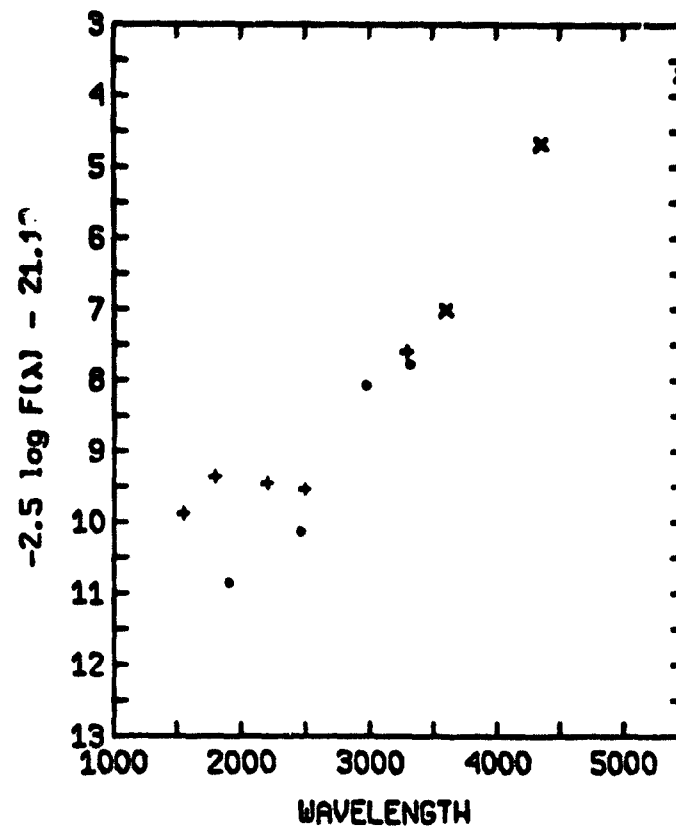
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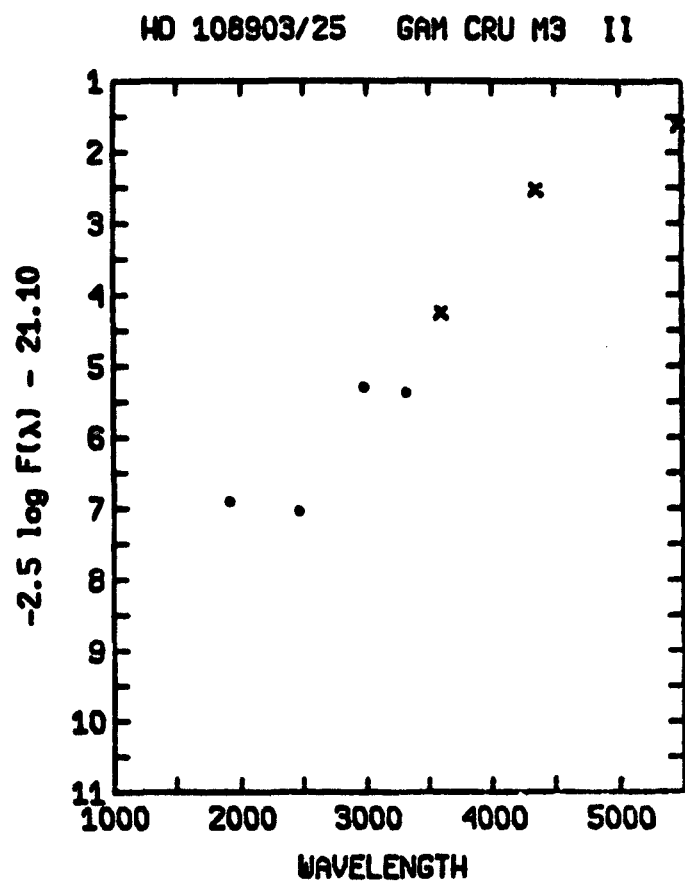
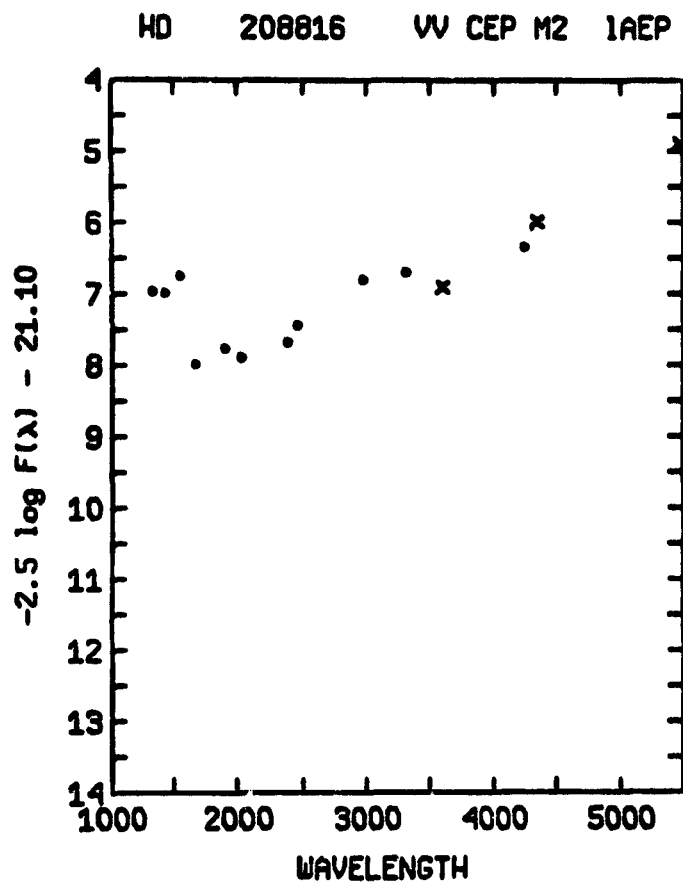


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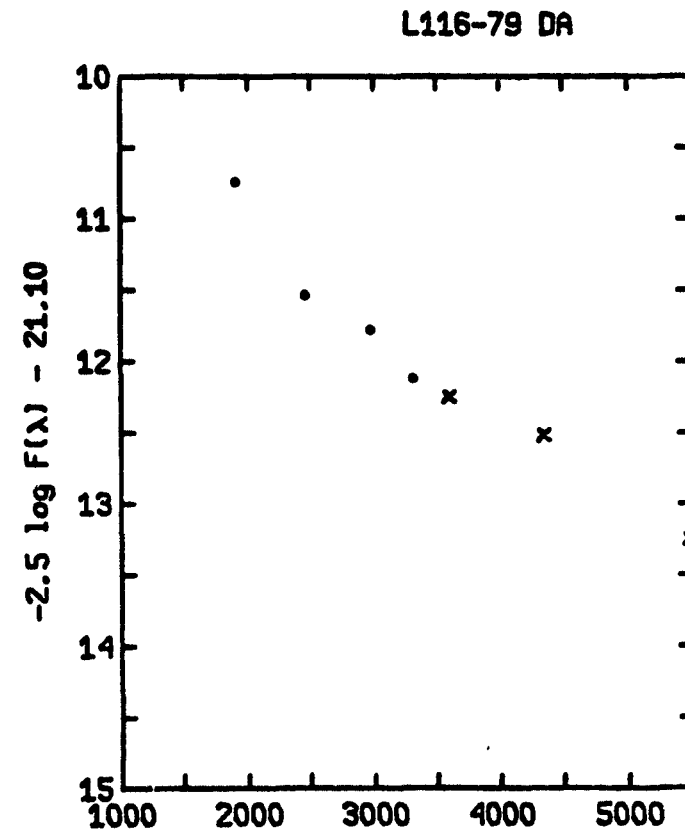
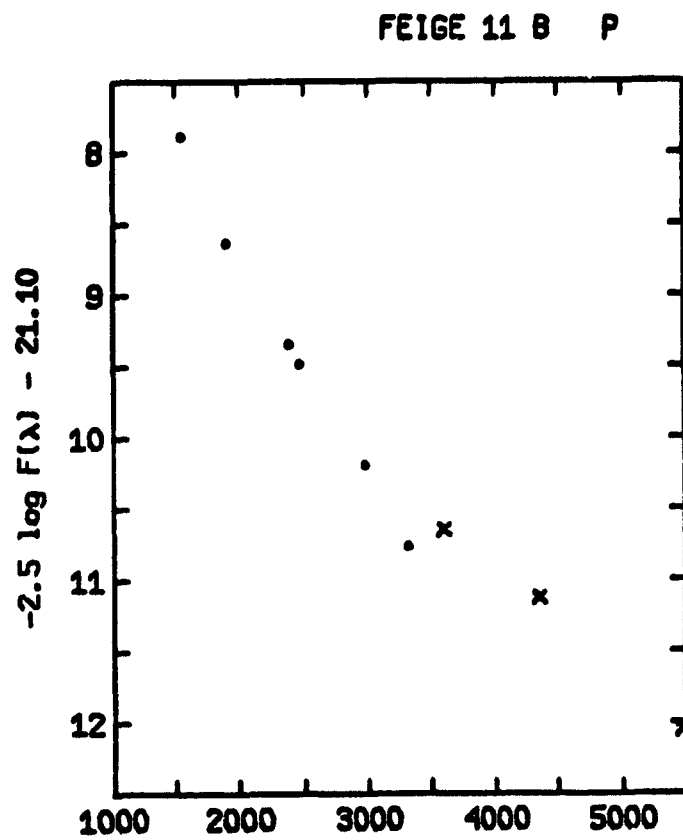


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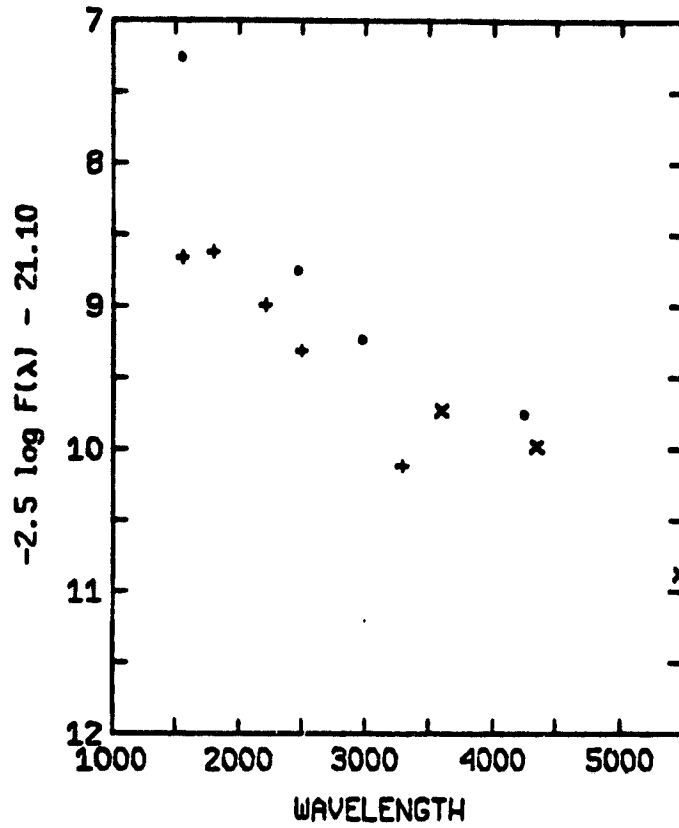




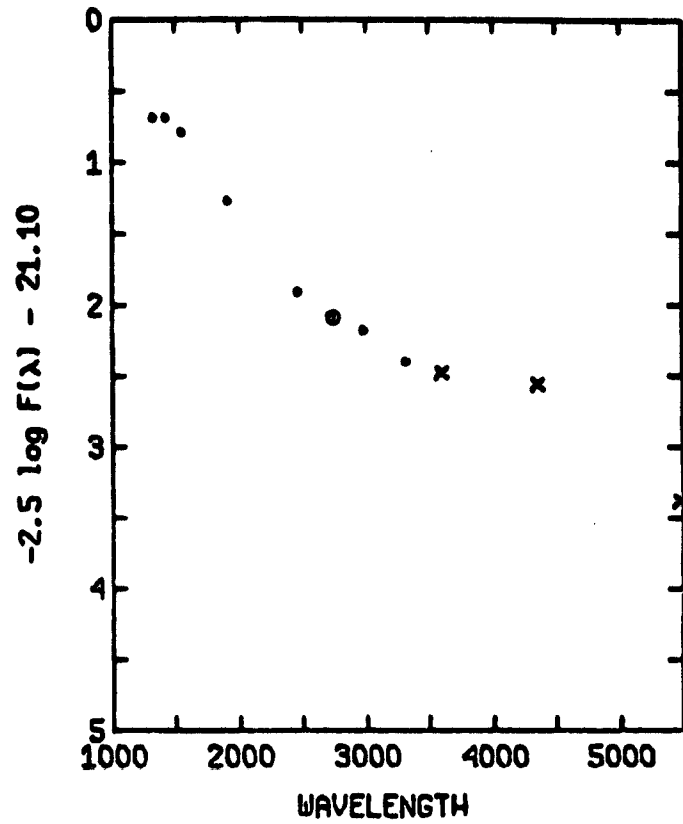
other spectral classifications
ZZ1-ZZ2



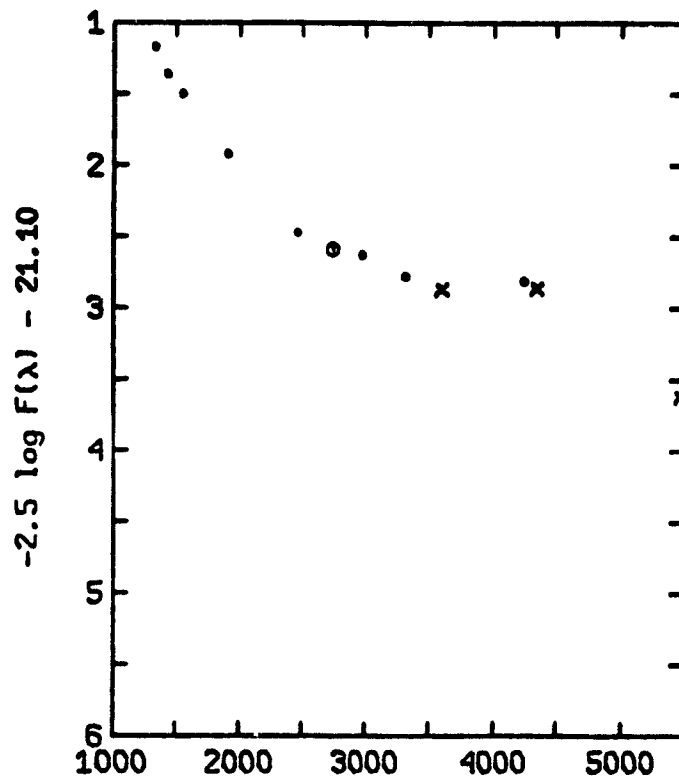
-15° 115 B2



HD 11415 EPS CAS B2 P



HD 217675 OMI AND B6 + A2P



HD 125823 A CEN B7 IIIP

